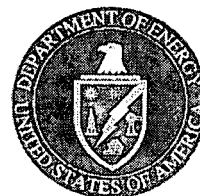
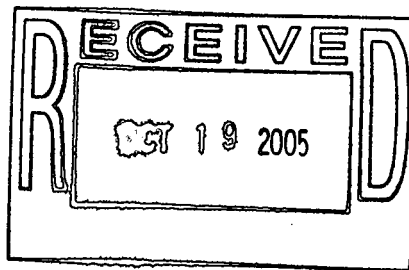




KAISER-HILL
COMPANY,
LLC

FY2005 FINAL Historical Release Report

Volume I
Introduction – 600 Area



October 2005

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TABLE OF CONTENTS

VOLUME I

ACRONYMS AND ABBREVIATIONS.....	XII
1.0 INTRODUCTION.....	1
1.1 Background	1
1.2 Modifications to HRR Evaluation	9
1.2.1 Data Comparison Values	9
1.3 HRR Format.....	12
1.3.1 Conventions	12
1.4 Significant Events	14
2.0 REFERENCES.....	14
NE AREA.....	16
PAC REFERENCE NUMBER: NE-110.....	18
PAC REFERENCE NUMBER: NE-111.1	25
PAC REFERENCE NUMBERS: NE-111.2, NE-111.3, NE-111.5 – NE-111.8.....	31
PAC REFERENCE NUMBER: NE-111.4.....	38
PAC REFERENCE NUMBERS: NE-142.1 – 142.4.....	43
PAC REFERENCE NUMBERS: NE-142.5 – 142.9.....	50
PAC REFERENCE NUMBER: NE-142.12.....	57
PAC REFERENCE NUMBER: NE-156.2.....	61
PAC REFERENCE NUMBERS: NE-166.1, NE-166.2, and NE-166.3.....	64
PAC REFERENCE NUMBER: NE-167.1	67
PAC REFERENCE NUMBERS: NE-167.2 and NE-167.3	70
PAC REFERENCE NUMBER: NE-216.1	73
PAC REFERENCE NUMBER: NE-216.2 and NE-216.3.....	76
PAC REFERENCE NUMBER: NE-1400.....	79
PAC REFERENCE NUMBER: NE-1401.....	81
PAC REFERENCE NUMBER: NE-1402.....	83
PAC REFERENCE NUMBER: NE-1403.....	85
PAC REFERENCE NUMBER: NE-1404.....	87
PAC REFERENCE NUMBER: NE-1405.....	89
PAC REFERENCE NUMBER: NE-1406.....	91
PAC REFERENCE NUMBER: NE-1407.....	93
PAC REFERENCE NUMBER: NE-1408.....	95
PAC REFERENCE NUMBER: NE-1409.....	97
PAC REFERENCE NUMBER: NE-1410.....	100
PAC REFERENCE NUMBER: NE-1411	102
PAC REFERENCE NUMBERS: NE-1412 and NE-1413	104
NW AREA	108
PAC REFERENCE NUMBER: NW-114.....	109
PAC REFERENCE NUMBER: NW-170.....	113
PAC REFERENCE NUMBER: NW-174a.....	116
PAC REFERENCE NUMBER: NW-174b.....	119

PAC REFERENCE NUMBER: NW-195.....	121
PAC REFERENCE NUMBER: NW-203.....	123
PAC REFERENCE NUMBER: NW-1500.....	126
PAC REFERENCE NUMBER: NW-1501.....	128
PAC REFERENCE NUMBER: NW-1502.....	130
PAC REFERENCE NUMBER: NW-1503.....	132
PAC REFERENCE NUMBER: NW-1504.....	134
PAC REFERENCE NUMBER: NW-1505.....	136
SE AREA	138
PAC REFERENCE NUMBER: SE-142.10.....	139
PAC REFERENCE NUMBER: SE-142.11.....	143
PAC REFERENCE NUMBER: SE-209.....	147
PAC REFERENCE NUMBER: SE-1600.....	149
PAC REFERENCE NUMBERS: SE-1601.1 and SE-1601.2.....	151
PAC REFERENCE NUMBER: SE-1602.....	153
SW AREA.....	156
PAC REFERENCE NUMBER: SW-115	157
PAC REFERENCE NUMBERS: SW-133.1, SW-133.2, SW-133.3, SW-133.4, SW-1701, and SW-1702	161
PAC REFERENCE NUMBER: SW-133.5	166
PAC REFERENCE NUMBER: SW-133.6	171
PAC REFERENCE NUMBER: SW-196	173
PAC REFERENCE NUMBER: SW-1700	176
000 AREA	178
PAC REFERENCE NUMBER: 000-101	180
PAC REFERENCE NUMBER: 000-121	185
PAC REFERENCE NUMBER: 000-162	192
PAC REFERENCE NUMBER: 000-168	195
PAC REFERENCE NUMBER: 000-172	197
PAC REFERENCE NUMBER: 000-190	200
PAC REFERENCE NUMBER: 000-192	203
PAC REFERENCE NUMBER: 000-500	205
PAC REFERENCE NUMBER: 000-501	210
PAC REFERENCE NUMBER: 000-502	212
PAC REFERENCE NUMBER: 000-503	213
PAC REFERENCE NUMBER: 000-504	215
PAC REFERENCE NUMBER: 000-505	222
100 AREA	226
PAC REFERENCE NUMBER: 100-148	227
PAC REFERENCE NUMBER: 100-600	231
PAC REFERENCE NUMBER: 100-601	233
PAC REFERENCE NUMBER: 100-602	235
PAC REFERENCE NUMBER: 100-603	238
PAC REFERENCE NUMBER: 100-604	241
PAC REFERENCE NUMBER: 100-605	243

PAC REFERENCE NUMBER: 100-606	245
PAC REFERENCE NUMBER: 100-607	247
PAC REFERENCE NUMBER: 100-608	251
PAC REFERENCE NUMBER: 100-609	253
PAC REFERENCE NUMBER: 100-610	256
PAC REFERENCE NUMBER: 100-611	258
PAC REFERENCE NUMBER: 100-612	260
PAC REFERENCE NUMBER: 100-613	262
300 AREA	264
PAC REFERENCE NUMBER: 300-128	265
PAC REFERENCE NUMBERS: 300-134N and 300-134s.....	268
PAC REFERENCE NUMBER: 300-135	273
PAC REFERENCE NUMBER: 300-151	275
PAC REFERENCE NUMBER: 300-156.1	277
PAC REFERENCE NUMBER: 300-171	279
PAC REFERENCE NUMBER: 300-181	282
PAC REFERENCE NUMBER: 300-186	284
PAC REFERENCE NUMBER: 300-188	288
PAC REFERENCE NUMBER: 300-206	290
PAC REFERENCE NUMBER: 300-212	292
PAC REFERENCE NUMBER: 300-700	294
PAC REFERENCE NUMBER: 300-701	297
PAC REFERENCE NUMBER: 300-702	299
PAC REFERENCE NUMBER: 300-703	301
PAC REFERENCE NUMBER: 300-704	303
PAC REFERENCE NUMBER: 300-705	305
PAC REFERENCE NUMBER: 300-706	307
PAC REFERENCE NUMBER: 300-707	309
PAC REFERENCE NUMBER: 300-708	311
PAC REFERENCE NUMBER: 300-709	314
PAC REFERENCE NUMBER: 300-710	316
PAC REFERENCE NUMBER: 300-711	318
PAC REFERENCE NUMBER: 300-712	320
PAC REFERENCE NUMBER: 300-713	322
PAC REFERENCE NUMBER: 300-714	324
PAC REFERENCE NUMBER: 300-715	326
400 AREA	328
PAC REFERENCE NUMBER: 400-116.1	329
PAC REFERENCE NUMBER: 400-116.2	332
PAC REFERENCE NUMBER: 400-122	335
PAC REFERENCE NUMBER: 400-129	338
PAC REFERENCE NUMBERS: 400-136.1 and 400-136.2.....	341
PAC REFERENCE NUMBER: 400-157.1	344
PAC REFERENCE NUMBER: 400-157.2	347
PAC REFERENCE NUMBER: 400-182	351
PAC REFERENCE NUMBER: 400-187	353

PAC REFERENCE NUMBER: 400-191	355
PAC REFERENCE NUMBER: 400-193	357
PAC REFERENCE NUMBER: 400-204	359
PAC REFERENCE NUMBER: 400-205	361
PAC REFERENCE NUMBER: 400-207	364
PAC REFERENCE NUMBER: 400-208	367
PAC REFERENCE NUMBER: 400-800	370
PAC REFERENCE NUMBER: 400-801	372
PAC REFERENCE NUMBER: 400-802	375
PAC REFERENCE NUMBER: 400-803	378
PAC REFERENCE NUMBER: 400-804	380
PAC REFERENCE NUMBER: 400-805	382
PAC REFERENCE NUMBER: 400-806	384
PAC REFERENCE NUMBER: 400-807	386
PAC REFERENCE NUMBER: 400-808	388
PAC REFERENCE NUMBER: 400-809	390
PAC REFERENCE NUMBER: 400-810	392
PAC REFERENCE NUMBER: 400-811	395
PAC REFERENCE NUMBER: 400-812	397
PAC REFERENCE NUMBER: 400-813	399
PAC REFERENCE NUMBER: 400-814	402
PAC REFERENCE NUMBER: 400-815	404
PAC REFERENCE NUMBER: 400-820	407
500 AREA	408
PAC REFERENCE NUMBER: 500-117.1	409
PAC REFERENCE NUMBER: 500-117.2	412
PAC REFERENCE NUMBER: 500-158	415
PAC REFERENCE NUMBER: 500-159	418
PAC REFERENCE NUMBER: 500-169	422
PAC REFERENCE NUMBER: 500-197	425
PAC REFERENCE NUMBER: 500-900	429
PAC REFERENCE NUMBER: 500-901	432
PAC REFERENCE NUMBER: 500-902	435
PAC REFERENCE NUMBER: 500-903	438
PAC REFERENCE NUMBER: 500-904	440
PAC REFERENCE NUMBER: 500-905	443
PAC REFERENCE NUMBER: 500-906	446
PAC REFERENCE NUMBER: 500-907	449
PAC REFERENCE NUMBER: 500-908	452
PAC REFERENCE NUMBER: 500-909	454
600 AREA	456
PAC REFERENCE NUMBER: 600-117.3	457
PAC REFERENCE NUMBER: 600-120.1	460
PAC REFERENCE NUMBER: 600-120.2	463
PAC REFERENCE NUMBER: 600-152	465
PAC REFERENCE NUMBER: 600-160	468

PAC REFERENCE NUMBER: 600-161	472
PAC REFERENCE NUMBER: 600-164.1	474
PAC REFERENCE NUMBER: 600-189	477
PAC REFERENCE NUMBER: 600-1000	479
PAC REFERENCE NUMBER: 600-1001	482
PAC REFERENCE NUMBER: 600-1001(a)	485
PAC REFERENCE NUMBER: 600-1002	488
PAC REFERENCE NUMBER: 600-1003	491
PAC REFERENCE NUMBER: 600-1004	494
PAC REFERENCE NUMBER: 600-1005	497

VOLUME II

700 AREA	499
PAC REFERENCE NUMBER: 700-118.1	500
PAC REFERENCE NUMBER: 700-118.2	504
PAC REFERENCE NUMBER: 700-123.1	506
PAC REFERENCE NUMBER: 700-123.2	509
PAC REFERENCE NUMBER: 700-124.1, 700-124.2, 700-124.3	512
PAC REFERENCE NUMBER: 700-125	516
PAC REFERENCE NUMBERS: 700-126.1 and 700-126.2	517
PAC REFERENCE NUMBER: 700-127	520
PAC REFERENCE NUMBER: 700-131	523
PAC REFERENCE NUMBER: 700-132	526
PAC REFERENCE NUMBER: 700-137	531
PAC REFERENCE NUMBER: 700-138	535
PAC REFERENCE NUMBER: 700-139.1(S)	538
PAC REFERENCE NUMBER: 700-139.1(N)(a)	541
PAC REFERENCE NUMBER: 700-139.1(N)(b)	543
PAC REFERENCE NUMBER: 700-139.2	546
PAC REFERENCE NUMBER: 700-143	548
PAC REFERENCE NUMBERS: 700-144(N) and 700-144(s)	552
PAC REFERENCE NUMBERS: 700-146.1 – 700-146.6	555
PAC REFERENCE NUMBER: 700-147.1	558
PAC REFERENCE NUMBER: 700-149.1	560
PAC REFERENCE NUMBER: 700-149.2	563
PAC REFERENCE NUMBER: 700-150.1	566
PAC REFERENCE NUMBER: 700-150.2(N)	570
PAC REFERENCE NUMBER: 700-150.2(S)	573
PAC REFERENCE NUMBER: 700-150.3	576
PAC REFERENCE NUMBER: 700-150.4	579
PAC REFERENCE NUMBER: 700-150.5	581
PAC REFERENCE NUMBERS: 700-150.6 and 700-150.8	583
PAC REFERENCE NUMBER: 700-150.7	586
PAC REFERENCE NUMBER: 700-163.1	588
PAC REFERENCE NUMBER: 700-163.2	590
PAC REFERENCE NUMBER: 700-185	593
PAC REFERENCE NUMBER: 700-194	595

PAC REFERENCE NUMBER: 700-214	597
PAC REFERENCE NUMBER: 700-215	601
PAC REFERENCE NUMBER: 700-1100	603
PAC REFERENCE NUMBER: 700-1101	606
PAC REFERENCE NUMBER: 700-1102	609
PAC REFERENCE NUMBER: 700-1103	613
PAC REFERENCE NUMBER: 700-1104	616
PAC REFERENCE NUMBER: 700-1105	619
PAC REFERENCE NUMBER: 700-1106	622
PAC REFERENCE NUMBER: 700-1107	624
PAC REFERENCE NUMBER: 700-1108	626
PAC REFERENCE NUMBER: 700-1109	630
PAC REFERENCE NUMBER: 700-1110	632
PAC REFERENCE NUMBER: 700-1111	634
PAC REFERENCE NUMBER: 700-1112	637
PAC REFERENCE NUMBER: 700-1113	640
PAC REFERENCE NUMBERS: 700-1114a and 700-1114b	642
PAC REFERENCE NUMBER: 700-1115	644
PAC REFERENCE NUMBER: 700-1116	646
PAC REFERENCE NUMBER: 700-1117	649
800 AREA	652
PAC REFERENCE NUMBER: 800-102	653
PAC REFERENCE NUMBER: 800-103	655
PAC REFERENCE NUMBER: 800-104	657
PAC REFERENCE NUMBER: 800-105.1 and 800-105.2	659
PAC REFERENCE NUMBER: 800-106	661
PAC REFERENCE NUMBER: 800-107	664
PAC REFERENCE NUMBER: 800-145	667
PAC REFERENCE NUMBER: 800-147.2	669
PAC REFERENCE NUMBER: 800-164.2	671
PAC REFERENCE NUMBER: 800-164.3	674
PAC REFERENCE NUMBER: 800-177	677
PAC REFERENCE NUMBER: 800-178	680
PAC REFERENCE NUMBER: 800-179	682
PAC REFERENCE NUMBER: 800-180	685
PAC REFERENCE NUMBER: 800-211	688
PAC REFERENCE NUMBER: 800-217	690
PAC REFERENCE NUMBER: 800-1200	692
PAC REFERENCE NUMBER: 800-1201	695
PAC REFERENCE NUMBER: 800-1202	697
PAC REFERENCE NUMBER: 800-1203	699
PAC REFERENCE NUMBER: 800-1204	701
PAC REFERENCE NUMBER: 800-1205	704
PAC REFERENCE NUMBER: 800-1206	706
PAC REFERENCE NUMBER: 800-1207	708
PAC REFERENCE NUMBER: 800-1208	711

PAC REFERENCE NUMBER: 800-1209	714
PAC REFERENCE NUMBER: 800-1210	717
PAC REFERENCE NUMBER: 800-1211	720
PAC REFERENCE NUMBER: 800-1212	722
900 AREA	725
PAC REFERENCE NUMBER: 900-108	726
PAC REFERENCE NUMBER: 900-109	730
PAC REFERENCE NUMBER: 900-112	734
PAC REFERENCE NUMBER: 900-113	739
PAC REFERENCE NUMBER: 900-119.1	743
PAC REFERENCE NUMBER: 900-119.2	748
PAC REFERENCE NUMBER: 900-130	751
PAC REFERENCE NUMBER: 900-140	754
PAC REFERENCE NUMBER: 900-141	757
PAC REFERENCE NUMBER: 900-153	760
PAC REFERENCE NUMBER: 900-154	763
PAC REFERENCE NUMBER: 900-155	765
PAC REFERENCE NUMBER: 900-165	771
PAC REFERENCE NUMBER: 900-173	774
PAC REFERENCE NUMBER: 900-175	776
PAC REFERENCE NUMBER: 900-176	778
PAC REFERENCE NUMBER: 900-183	780
PAC REFERENCE NUMBER: 900-184	782
PAC REFERENCE NUMBER: 900-210	784
PAC REFERENCE NUMBER: 900-213	786
PAC REFERENCE NUMBER: 900-1300	789
PAC REFERENCE NUMBER: 900-1301	791
PAC REFERENCE NUMBER: 900-1302	793
PAC REFERENCE NUMBER: 900-1303	795
PAC REFERENCE NUMBER: 900-1304	797
PAC REFERENCE NUMBER: 900-1305	799
PAC REFERENCE NUMBER: 900-1306	801
PAC REFERENCE NUMBER: 900-1307	803
PAC REFERENCE NUMBER: 900-1308	805
PAC REFERENCE NUMBER: 900-1309	807
PAC REFERENCE NUMBER: 900-1310	810
PAC REFERENCE NUMBER: 900-1311	813
PAC REFERENCE NUMBER: 900-1312	816
PAC REFERENCE NUMBER: 900-1313	819
PAC REFERENCE NUMBER: 900-1314	821
PAC REFERENCE NUMBER: 900-1315	823
PAC REFERENCE NUMBER: 900-1316	825
PAC REFERENCE NUMBER: 900-1317	827
PAC REFERENCE NUMBER: 900-1318	829
UBCS.....	831
PAC REFERENCE NUMBER: UBC 122	832

PAC REFERENCE NUMBER: UBC 123	835
PAC REFERENCE NUMBER: UBC 125	839
PAC REFERENCE NUMBER: UBC 331	841
PAC REFERENCE NUMBER: UBC 371	844
PAC REFERENCE NUMBER: UBC 374	847
PAC REFERENCE NUMBER: UBC 439	850
PAC REFERENCE NUMBER: UBC 440	852
PAC REFERENCE NUMBER: UBC 441	855
PAC REFERENCE NUMBER: UBC 442	857
PAC REFERENCE NUMBER: UBC 444	859
PAC REFERENCE NUMBER: UBC 447	862
PAC REFERENCE NUMBER: UBC 528	865
PAC REFERENCE NUMBER: UBC 559	868
PAC REFERENCE NUMBER: UBC 701	872
PAC REFERENCE NUMBER: UBC 707	875
PAC REFERENCE NUMBER: UBC 731	879
PAC REFERENCE NUMBER: UBC 770	881
PAC REFERENCE NUMBER: UBC 771	884
PAC REFERENCE NUMBER: UBC 774	888
PAC REFERENCE NUMBER: UBC 776	891
PAC REFERENCE NUMBER: UBC 777	896
PAC REFERENCE NUMBER: UBC 778	900
PAC REFERENCE NUMBER: UBC 779	903
PAC REFERENCE NUMBER: UBC 865	907
PAC REFERENCE NUMBER: UBC 881	910
PAC REFERENCE NUMBER: UBC 883	914
PAC REFERENCE NUMBER: UBC 886	918
PAC REFERENCE NUMBER: UBC 887	921
PAC REFERENCE NUMBER: UBC 889	923
PAC REFERENCE NUMBER: UBC 991	926
OFF-SITE AREA.....	930
PAC REFERENCE NUMBER: OFF-SITE AREAS 1, 2, 3, and 4.....	931
PICS	939
PIC REFERENCE NUMBER: 1	940
PIC REFERENCE NUMBER: 2	942
PIC REFERENCE NUMBER: 3	944
PIC REFERENCE NUMBER: 4	946
PIC REFERENCE NUMBER: 5	948
PIC REFERENCE NUMBER: 6	950
PIC REFERENCE NUMBER: 7	952
PIC REFERENCE NUMBER: 8	954
PIC REFERENCE NUMBER: 9	956
PIC REFERENCE NUMBER: 10	958
PIC REFERENCE NUMBER: 11	960
PIC REFERENCE NUMBER: 12	962
PIC REFERENCE NUMBER: 13	964

PIC REFERENCE NUMBER: 14	966
PIC REFERENCE NUMBER: 15	968
PIC REFERENCE NUMBER: 16	970
PIC REFERENCE NUMBER: 17	972
PIC REFERENCE NUMBER: 18	974
PIC REFERENCE NUMBER: 19	976
PIC REFERENCE NUMBER: 20	978
PIC REFERENCE NUMBER: 21	980
PIC REFERENCE NUMBER: 22	982
PIC REFERENCE NUMBER: 23	984
PIC REFERENCE NUMBER: 24	986
PIC REFERENCE NUMBER: 25	988
PIC REFERENCE NUMBER: 26	990
PIC REFERENCE NUMBER: 27	992
PIC REFERENCE NUMBER: 28	994
PIC REFERENCE NUMBER: 29	996
PIC REFERENCE NUMBER: 30	998
PIC REFERENCE NUMBER: 31	1000
PIC REFERENCE NUMBER: 32	1002
PIC REFERENCE NUMBER: 33	1004
PIC REFERENCE NUMBER: 34	1006
PIC REFERENCE NUMBER: 35	1008
PIC REFERENCE NUMBER: 36	1010
PIC REFERENCE NUMBER: 37	1012
PIC REFERENCE NUMBER: 38	1014
PIC REFERENCE NUMBER: 39	1016
PIC REFERENCE NUMBER: 40	1018
PIC REFERENCE NUMBER: 41	1020
PIC REFERENCE NUMBER: 42	1022
PIC REFERENCE NUMBER: 43	1024
PIC REFERENCE NUMBER: 44	1026
PIC REFERENCE NUMBER: 45	1028
PIC REFERENCE NUMBER: 46	1030
PIC REFERENCE NUMBER: 47	1032
PIC REFERENCE NUMBER: 48	1034
PIC REFERENCE NUMBER: 49	1036
PIC REFERENCE NUMBER: 50	1038
PIC REFERENCE NUMBER: 51	1040
PIC REFERENCE NUMBER: 52	1042
PIC REFERENCE NUMBER: 53	1044
PIC REFERENCE NUMBER: 54	1046
PIC REFERENCE NUMBER: 55	1048
PIC REFERENCE NUMBER: 56	1050
PIC REFERENCE NUMBER: 57	1052
PIC REFERENCE NUMBER: 58	1054
PIC REFERENCE NUMBER: 59	1056

PIC REFERENCE NUMBER: 60	1058
PIC REFERENCE NUMBER: 61	1060
INDEX.....	1070

APPENDIX 1 HRR SITES AT RFETS

APPENDIX 2 CORRESPONDENCE

LIST OF FIGURES

Figure 1	Rocky Flats Environmental Technology Site.....	2
Figure 2	Rocky Flats Environmental Technology Site IHSSs.....	3
Figure 3	Rocky Flats Environmental Technology Site PACs	4
Figure 4	Rocky Flats Environmental Technology Site UBC Sites.....	5
Figure 5	Operable Units.....	8
Figure 6	Rocky Flats Environmental Technology Site Groundwater and Surface Water Monitoring Locations.....	11
Figure 7	HRR Area Boundaries.....	13
Figure 8	HRR Northeast Buffer Zone Area IHSSs and PACs.....	16
Figure 9	HRR Northeast Buffer Zone Area IHSSs and PACs Close-up View	17
Figure 10	HRR Northwest Buffer Zone Area IHSSs and PACs	108
Figure 11	HRR Southeast Buffer Zone Area IHSSs and PACs.....	138
Figure 12	HRR Southwest Buffer Zone Area IHSSs and PACs	156
Figure 13	HRR 000 Area Storm Drains and Sanitary Sewers	178
Figure 14	HRR 000 Area OPWL, NPWL, IHSSs, and PACs	179
Figure 15	HRR 100 Area IHSSs and PACs.....	226
Figure 16	HRR 300 Area IHSSs and PACs.....	264
Figure 17	PAC 300-700	295
Figure 18	HRR 400 Area IHSSs and PACs.....	328
Figure 19	HRR 500 Area IHSSs and PACs.....	408
Figure 20	HRR 600 Area IHSSs and PACs.....	456
Figure 21	HRR 700 Area IHSSs and PACs.....	499
Figure 22	HRR 800 Area IHSSs and PACs.....	652
Figure 23	HRR 900 Area IHSSs and PACs.....	725
Figure 24	HRR UBCs	831
Figure 25	HRR Operable Unit 3	930
Figure 26	PIC Locations	939
Figure 27	Buffer Zone Contamination Report Site Locations.....	1062

LIST OF TABLES

Table 1	RFCA Consolidation of IAG OUs.....	6
Table 2	Final RFCA OUs (April 2004)	7

ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/100\text{ cm}^2$	micrograms per 100 square centimeters
μCi	microcuries
$\mu\text{Ci/g}$	microcuries per gram
$\mu\text{g}/\text{cm}^2$	micrograms per square centimeter
$\mu\text{g/kg}$	micrograms per kilogram (also $\mu\text{g}/\text{kg}$)
$\mu\text{g/L}$	micrograms per liter (also $\mu\text{g}/\text{L}$)
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
$\mu\text{mhos}/\text{cm}$	micromhos per centimeter
ACM	asbestos-containing material
AL	action level
AOC	Areas of Concern
AOI	analyte of interest
AR	Administrative Record
ARA	Accelerated Response Action
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
BZ	Buffer Zone
BZCR	Buffer Zone Contamination Report
BZSAP	Buffer Zone Sampling and Analysis Plan
CAD/ROD	Corrective Action Decision/Record of Decision
CCR	Code of Colorado Regulations
CDH	Colorado Department of Health
CDPHE	Colorado Department of Public Health and Environment
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHWA	Colorado Hazardous Waste Act
cm	centimeter
COC	contaminant of concern

CPIR	Contingency Plan Implementation Report
cpm	counts per minute
cpm/ft ²	counts per minute per square feet
CRA	Comprehensive Risk Assessment
CSU	Colorado State University
CSV	Central Storage Vault
CWTS	Caustic Waste Treatment System
cy	cubic yard
D&D	decontamination and decommissioning
DNAPL	dense nonaqueous phase liquid
dpm/100 cm ²	disintegrations per minute per 100 square centimeters
dpm/m ²	disintegrations per minute per square meter
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
dpm	disintegrations per minute
dpm/g	disintegrations per minute per gram
dpm/kg	disintegrations per minute per kilogram
dpm/L	disintegrations per minute per liter
DQO	data quality objective
DRT	dirt, rubble, and trash
EG&G	EG&G Rocky Flats, Inc.
EM	electromagnetic
EP	Extraction Procedure
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ERA	Ecological Risk Assessment
ESL	ecological screening level
FIDLER	Field Instrument for Detection of Low-Energy Radiation
ft	foot
ft ²	square foot
ft ³	cubic foot

FY	Fiscal Year
g	gram
gpm	gallons per minute
GPR	ground penetrating radar
GPS	Global Positioning System
HAZMAT	Hazardous Materials
HDPE	high-density polyethylene
HEPA	high efficiency particulate air
HHRA	Human Health Risk Assessment
HI	hazard index
HNO ₃	nitric acid
HPGe	High Purity Germanium
HQ	hazard quotient
HRC®	Hydrogen Release Compound
HRR	Historical Release Report
IA	Industrial Area
IABZSAP	Industrial Area Buffer Zone Sampling and Analysis Plan
IAG	Interagency Agreement
IASAP	Industrial Area Sampling and Analysis Plan
IBC	intermediate bulk container
IDM	investigation-derived material
IGD	Implementation Guidance Document
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Plan
IRIS	Integrated Risk Information System
ITPH	Interceptor Trench Pump House
ITS	Interceptor Trench System
IWCP	Integrated Work Control Program
K-H	Kaiser Hill Company, L.L.C.
kg	kilogram
KOH	potassium hydroxide
lb	pound

LHSU	lower hydrostratigraphic unit
LLMW	low-level mixed waste
LLW	low level waste
LRA	Lead Regulatory Agency
LTTD	low-temperature thermal desorption
M&TE	Measurement and Test Equipment
mCi	millicurie
MCL	maximum contaminant level
MDC	maximum detected concentration
MDL	method detection limit
MEK	methyl ethyl ketone
mg/100 cm	milligrams per 100 centimeters
mg/kg	milligrams per kilogram
mg/kg/day	milligrams per kilogram per day
mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
MPL	maximum permissible limit
mrem	millirem
mrem/hr	millirems per hour
mrem/yr	millirems per year
MRI	Midwest Research Institute
MS	matrix spike
MSDS	Material Safety Data Sheet
MST	modular storage tank
NaOH	sodium hydroxide
NAPL	nonaqueous phase liquid
nCi/g	nanocuries per gram
NFA	No Further Action
NFAA	No Further Accelerated Action
NLR	no longer representative
NPDES	National Pollutant Discharge Elimination System
NPWL	New Process Waste Line
NTS	Nevada Test Site

OPWL	Original Process Waste Line
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA	Protected Area
PAC	Potential Area of Concern
PAH	polynuclear aromatic hydrocarbon or polyaromatic hydrocarbon
PAM	Proposed Action Memorandum
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picocuries per gram
pCi/L	picocuries per liter
pCi/m ³	picocuries per cubic meter
pCi/mL	picocuries per milliliter
PCOC	potential contaminant of concern
PDSR	Pre-Demolition Survey Report
PEL	permissible exposure limit
pg/g	picograms per gram
PIC	Potential Incident of Concern
POC	Point of Compliance
POE	Point of Evaluation
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PPRG	proposed preliminary remediation goal
PQL	practical quantitation limit
PRG	preliminary remediation goal
PSZ	Perimeter Security Zone
PU&D	Property Utilization and Disposal
PVC	polyvinyl chloride
R&D	Research and Development
RAO	remedial action objective
RAS	Risk Assessment Screen
RBC	risk-based concentration

RCA	Radiologically Controlled Area
RCR	Regulatory Contact Record
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFCA Parties	DOE, CDPHE, EPA
RFETS or Site	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
RFPO	Rocky Flats Project Office
RI	Remedial Investigation
RL	reporting limit
RMRS	Rocky Mountain Remediation Services
RO	reverse osmosis
RQ	reportable quantity
RSOP	RFCA Standard Operating Protocol
S&W	Swinerton and Walberg
S-R	Stacker-Retriever
SAP	Sampling and Analysis Plan
SDWA	Safe Drinking Water Act
SEP	Solar Evaporation Ponds
SID	South Interceptor Ditch
SNM	special nuclear material
SOE	Stationary Operating Engineer
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
STP	Sewage Treatment Plant
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWD	Soil Water Database
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCE	trichloroethylene

TCLP	Toxicity Characteristic Leaching Procedure
TDEM	time-domain electromagnetic
TDS	total dissolved solids
TEF	toxicity equivalency factor
TEQ	toxic equivalency
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
TRU	transuranic
TSCA	Toxic Substances Control Act
TSS	total suspended solids
UBC	Under Building Contamination
UCL	upper confidence limit
UHSU	upper hydrostratigraphic unit
USDA	U.S. Department of Agriculture
UST	underground storage tank
VOA	volatile organic analyte
VOC	volatile organic compound
WEPP	Water Erosion Prediction Project
WHO	World Health Organization
WIPP	Waste Isolation Pilot Plant
WQP	water quality parameter
WRW	wildlife refuge worker
WSRIC	Waste Stream and Residue Identification and Characterization
WWTF	Waste Water Treatment Facility
XRF	x-ray fluorescence

1.0 INTRODUCTION

The Fiscal Year (FY) 2005 Final Historical Release Report (HRR) for the U.S. Department of Energy's (DOE's) Rocky Flats Environmental Technology Site (RFETS or Site) in Jefferson County, Colorado, is the final update to the HRRs (DOE 1992 - 2004). The location of RFETS is shown on Figure 1. The FY2005 Final HRR presents a summary of information on all Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), and Under Building Contamination (UBC) Sites identified at RFETS. The locations of IHSSs, PACs, and UBC Sites are shown on Figures 2, 3, and 4, respectively. Additional map detail is shown on individual HRR Area maps (Section 1.3). Additionally, this FY2005 Final HRR updates the Potential Incidents of Concern (PICs) and includes information on the disposition of areas identified by the Colorado Department of Public Health and Environment (CDPHE). The purpose of the FY2005 Final HRR is to summarize previously collected information from quarterly and annual updates and from recent sampling, analysis, and accelerated actions into one final PAC narrative. The FY2005 Final HRR supercedes all previous HRRs; however, all previous updates are retained as references for this HRR.

1.1 Background

RFETS began operation in 1951. During Plant operations, materials defined as hazardous substances, pollutants, and contaminants by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and materials defined as hazardous waste and hazardous constituents by the Resource Conservation and Recovery Act (RCRA) and/or the Colorado Hazardous Waste Act (CHWA), were produced, purchased, stored, consumed, disposed, and released at various locations at RFETS.

RCRA regulations require that all Solid Waste Management Units (SWMUs) be identified. This became applicable on July 31, 1986, when DOE, Colorado Department of Health (CDH), and the U.S. Environmental Protection Agency (EPA) entered into a Compliance Agreement (DOE et al. 1986). At that time, the exact definition of a SWMU had not been formalized; therefore, guidance from the State of Colorado and the regional office of EPA was used. The SWMU terminology is a RCRA designation consisting of inactive waste disposal sites, accidentally contaminated sites, and sites found to pose environmental concern due to past or current waste management practices. The State of Colorado and EPA required the identification of all areas where environmental releases may have occurred, including hazardous waste and nonhazardous waste-related releases. Also included were single-release areas and long-term waste management areas where waste storage may (or was known to) have occurred.

SWMUs at RFETS were initially identified in 1985 by the DOE Los Alamos Operations Office and are presented in the Draft Comprehensive Environmental Assessment and Response Program (CEARP) Phase I: Installation Assessment (DOE 1986a). The study consisted of a records search, open literature survey, and interviews with RFETS employees. Inspections were conducted at each site. The first identification of RFETS SWMUs, consistent with the guidance provided by the State of Colorado and the regional EPA, was presented as an appendix to the November 1986 RCRA Part B Permit Application (DOE 1986b).

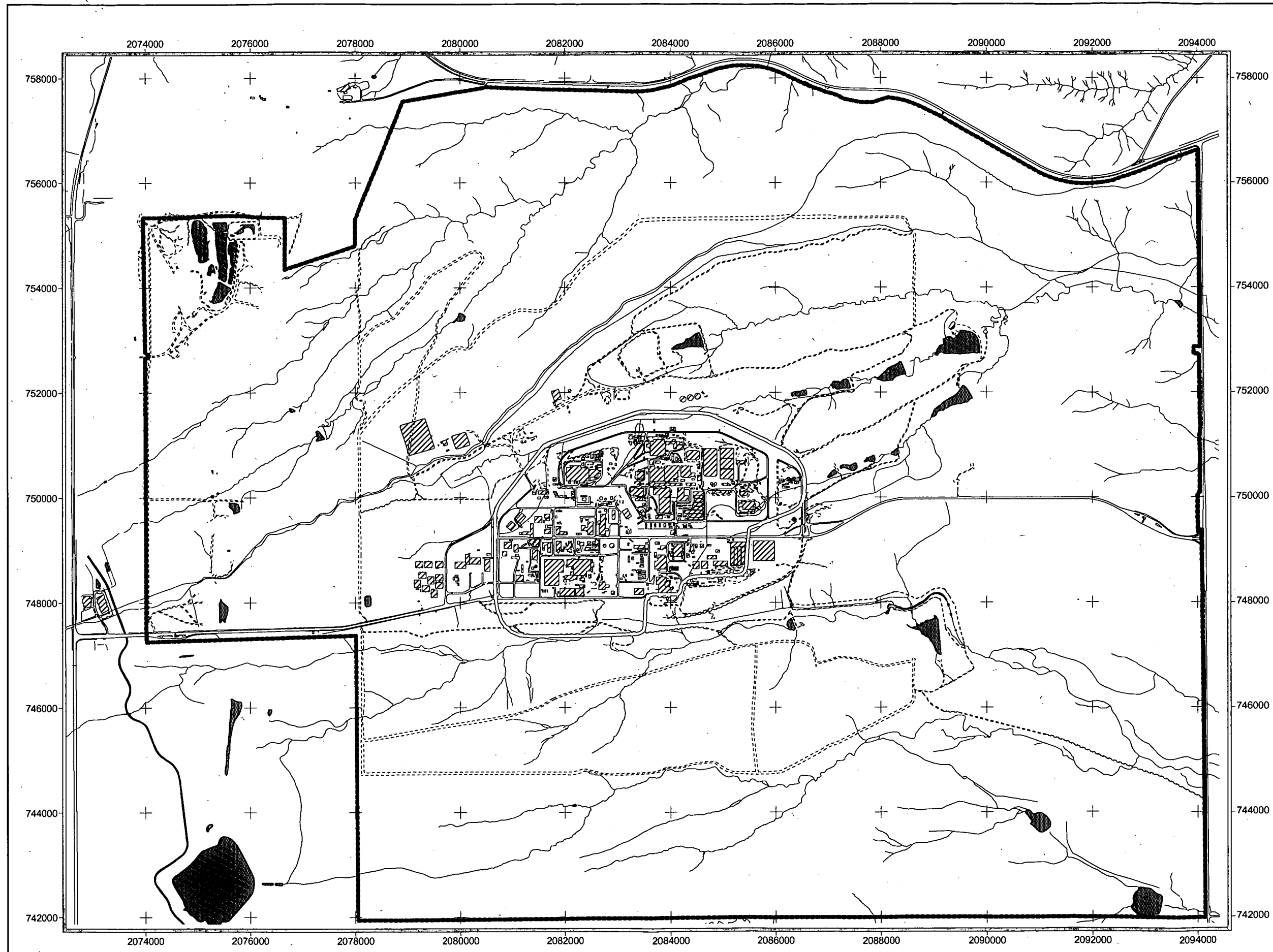








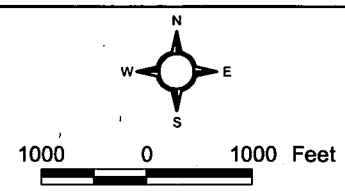


Figure 1
Rocky Flats Environmental
Technology Site

KEY

-  IA boundary
-  Site boundary
-  Stream
-  Dirt road
-  Paved road
-  Lake
-  Demolished structure
-  Structure



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 State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27







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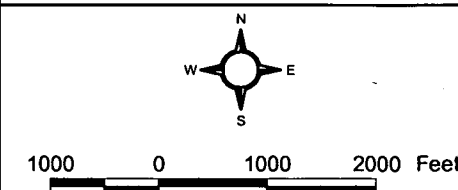
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Figure 2
Rocky Flats Environmental
Technology Site IHSSs

KEY

-  Stream
-  Dirt road
-  Asphalt
-  IHSS
-  HRR area boundary
-  Lake



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Date: 09.20.05



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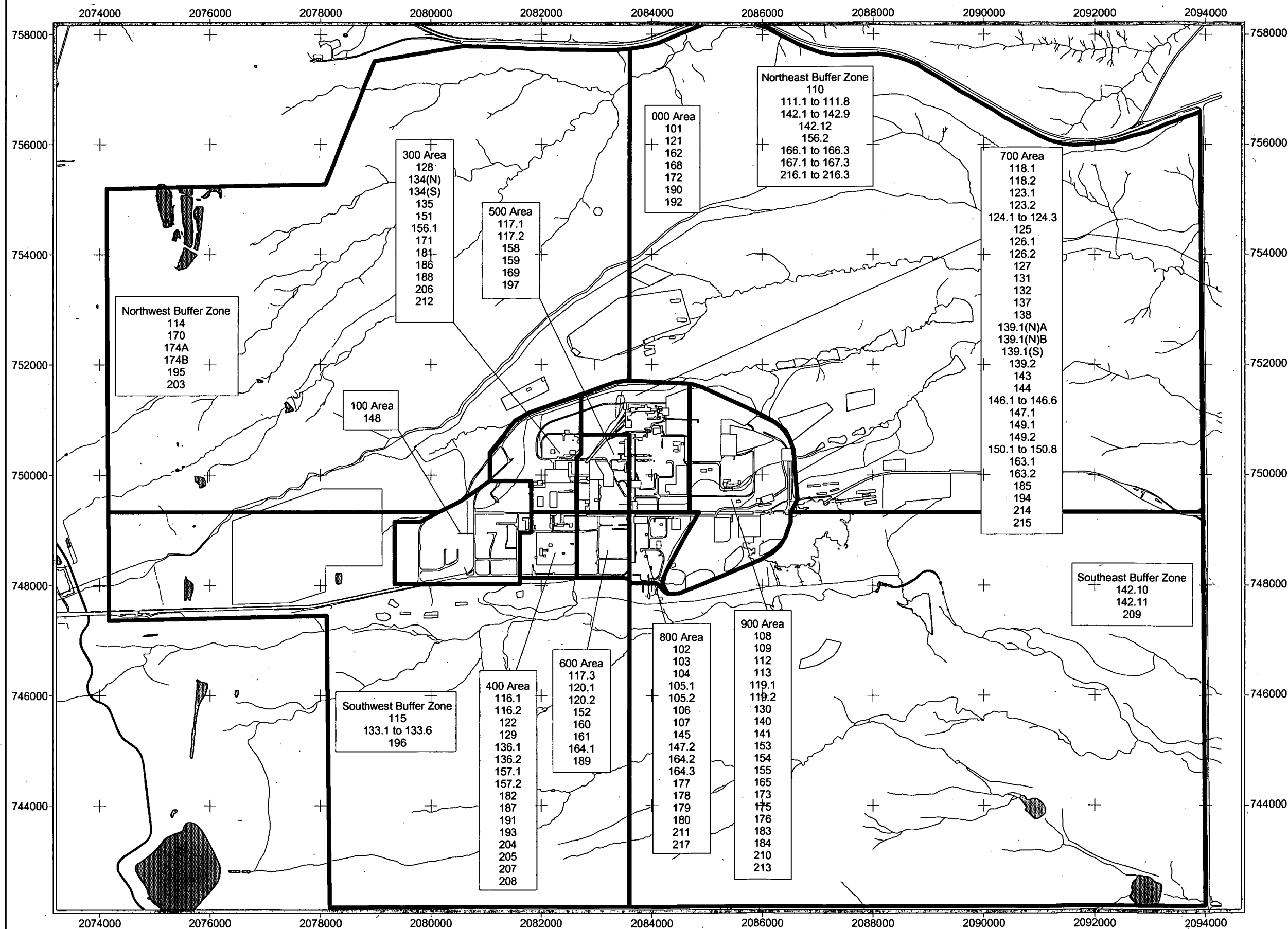






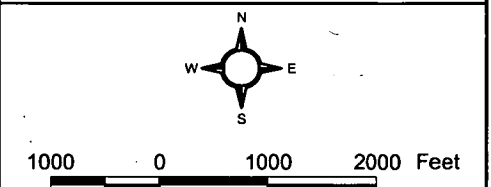


Figure 3
Rocky Flats Environmental
Technology Site PACs

KEY

-  Stream
-  Dirt road
-  Asphalt
-  PAC
-  HRR area boundary
-  Lake



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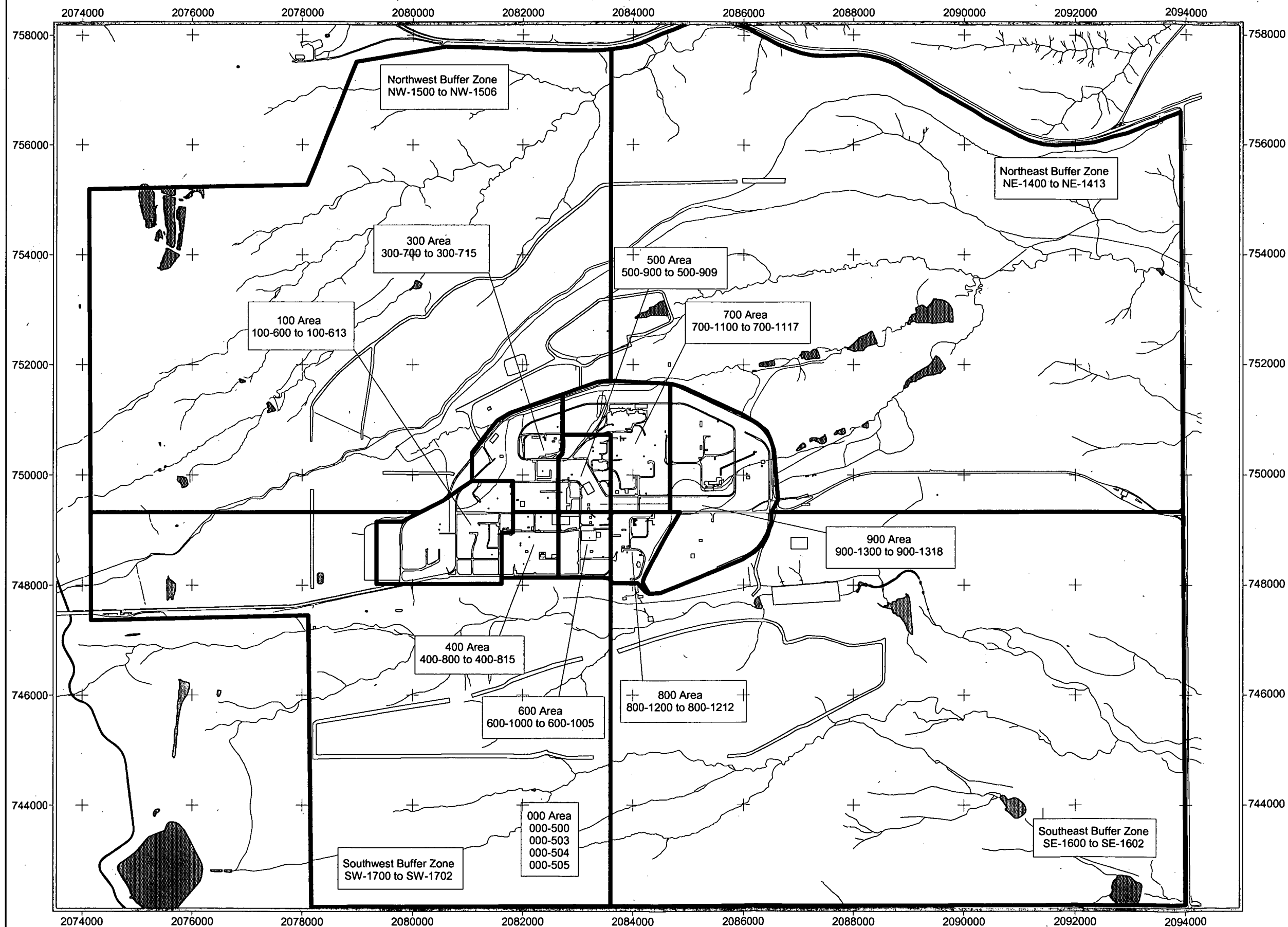






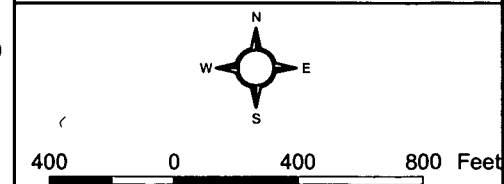


Figure 4
Rocky Flats Environmental
Technology Site UBCs

KEY

-  Stream
-  Dirt road
-  Asphalt
-  UBC
-  HRR area boundary
-  Lake



Scale = 1: 7,500

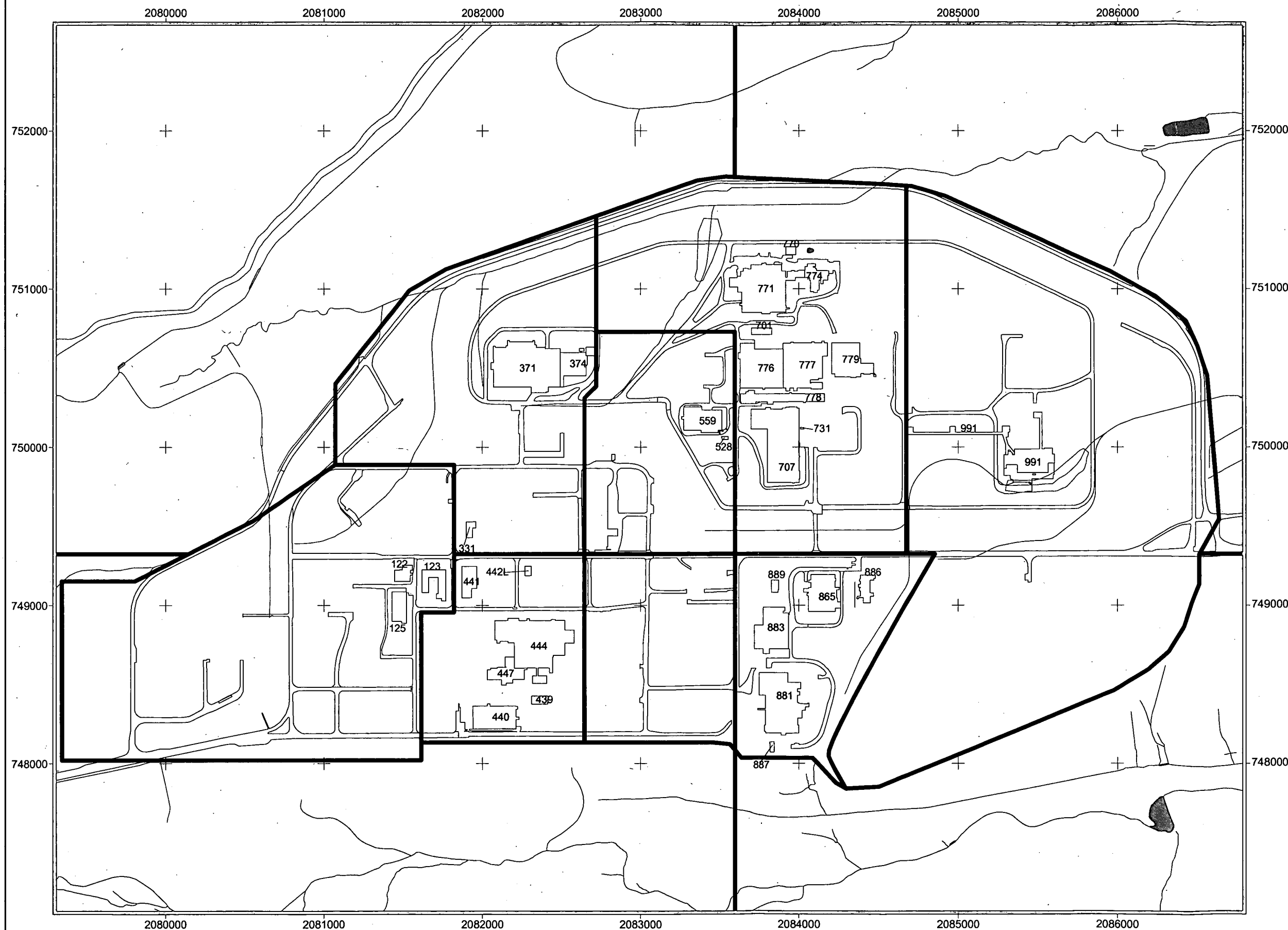
State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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Date: 09.20.05



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Formal efforts to document the extent of Site contamination were established with the signing of the Interagency Agreement (IAG) in 1991 (DOE et al. 1991). At that time, SWMUs at RFETS were renamed IHSSs. IHSS is a term defined in the IAG as "locations associated with a release or threat of release of hazardous substances that may cause harm to human health/or the environment." The IAG grouped IHSSs by similar contaminant or geographic location into 16 Operable Units (OUs), and schedules were developed for further characterization. In accordance with the IAG, an HRR was developed. The original intent of the HRR was to capture existing information on historical incidents and Plant practices involving hazardous substances at RFETS. Additionally, the IAG prescribed that the HRR reporting process continue quarterly for reporting of new or newly identified releases of hazardous substances to the environment (identified as PACs). The HRR was also used to provide updated information on data collection and remediation activities, and to disposition IHSSs, PACs, and UBC Sites as necessary.

Information used in the preparation of the initial HRR was compiled and interpreted over an 8-month period beginning in 1991. The initial information evaluation consisted of the following:

- File review, including internal memoranda, letters, reports, log books, meeting minutes, photographs, press releases, and other written documentation of RFETS operations, incidents, and past practices. More than 4,000 documents were used in the preparation of the 1992 HRR.
- Interviews with current and past employees.

Additional information on how the initial HRR was developed is found in the 1992 HRR (DOE 1992).

In 1996, the Rocky Flats Cleanup Agreement (RFCA) (DOE et al. 1996), signed by DOE, CDPHE, and EPA (the RFCA Parties), superseded the IAG. RFCA incorporated the earlier IAG requirements for updating the HRR; however, it was agreed that reporting would be required annually instead of quarterly. The first Annual Update was submitted in September 1996.

The 16 OUs designated in the IAG were consolidated into 10 OUs during the RFCA negotiation process to reduce field and administrative requirements. The consolidation of IAG OUs is presented in Table 1.

Table 1
RFCA Consolidation of IAG OUs

IAG OU Designation	RFCA OU Designation
OU 1	Unchanged Under RFCA
OU 2	Incorporated into Buffer Zone (BZ) OU
OU 3	Unchanged Under RFCA
OU 4	Incorporated into Industrial Area (IA) OU
OU 5	Unchanged Under RFCA
OU 6	Unchanged Under RFCA
OU 7	Unchanged Under RFCA
OU 8	Incorporated into IA OU
OU 9	Incorporated into IA OU

IAG OU Designation	RFCA OU Designation
OU 10	Incorporated into IA OU except for IHSSs 170, 174a, and 174b
OU 11	Closed Under CAD/ROD
OU 12	Incorporated into IAOU
OU 13	Incorporated into IA OU
OU 14	Incorporated into IA OU
OU 15	Closed Under CAD/ROD
OU 16	Closed Under CAD/ROD

At that time, Corrective Action Decisions/Record of Decisions (CAD/ROD) for OUs 11, 15, and 16 were already complete and CADs/RODs for OUs 1, 3, and 7 were in process or expected to be completed.

On April 13, 2004, DOE, EPA, and CDPHE determined that the 1996 OU Consolidation Plan should be modified to reflect the current status. The changes were based on the following:

1. OUs 1 and 3 were closed in accordance with the final CAD/RODs for these OUs.
2. The RFCA Parties believed that the IHSSs contained in OUs 5, 6, and 7 (as modified in July 1996) could be efficiently consolidated into the BZ OU to reduce the number of OUs that may need individual CAD/RODs.

As a result, the 10 OUs were consolidated into 7 OUs as shown in Table 2. The location of the OUs is shown on Figure 5.







Table 2
Final RFCA OUs (April 2004)

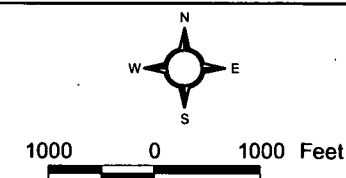
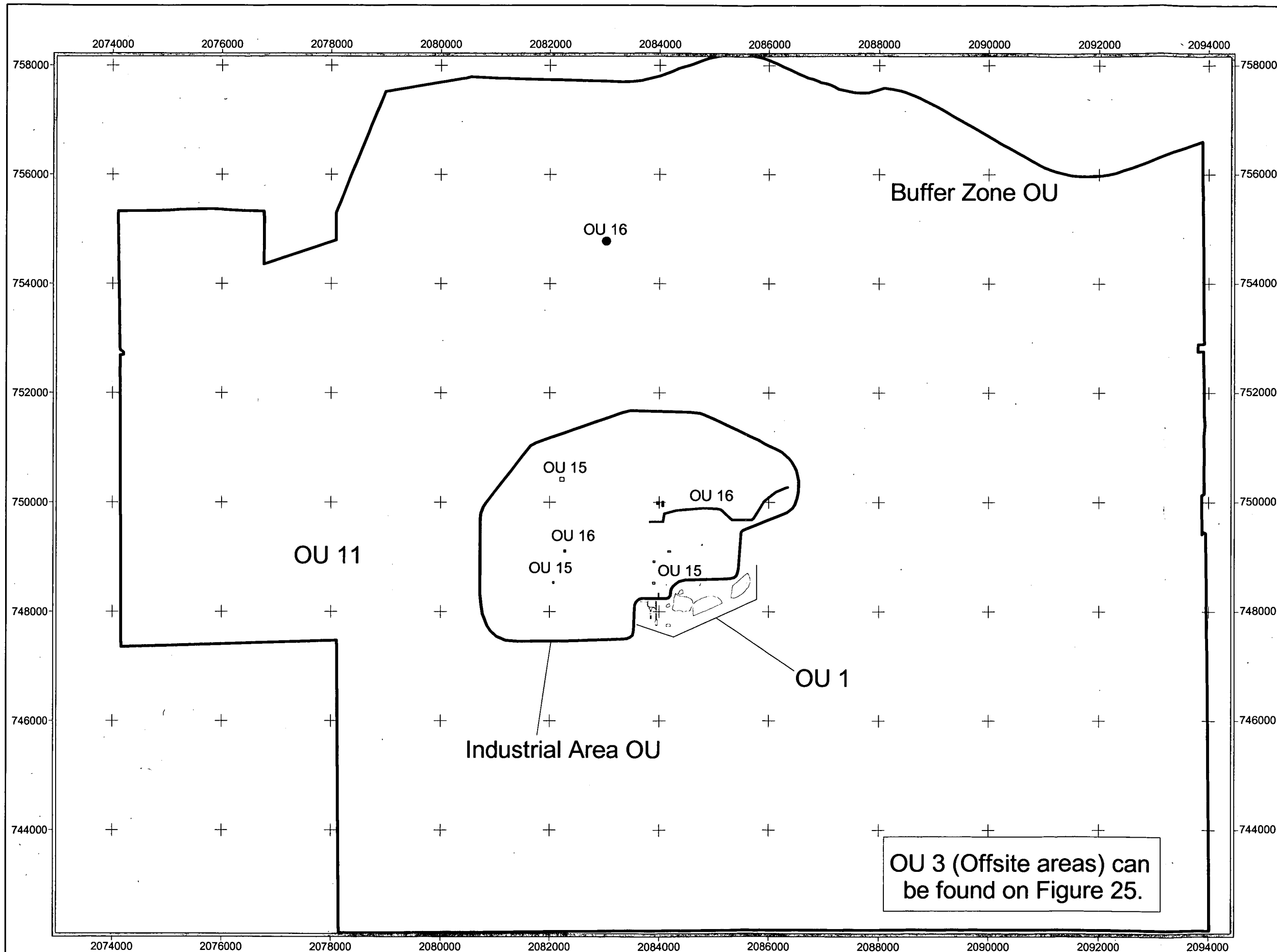
Former RFCA OU	Final RFCA OU	Description	Consisting of
1	1	881 Hillside Area	Current OU 1 IHSSs; CAD/ROD completed
3	3	Off-site Areas	Current OU 3 IHSSs; CAD/ROD completed
11	11	West Spray Field	Current OU 11 IHSSs; CAD/ROD completed
15	15	Inside Building Closures	Current OU 15 IHSSs; CAD/ROD completed
16	16	Low-Priority Sites	Current OU 16 IHSSs; CAD/ROD completed
IA	IA	IHSSs located within the IA	All current IHSSs associated with OUs 4, 8, 9, 12, 13, and 14; IHSSs 115 and 196 from OU 5; IHSSs 143 and 165 from OU 6; plus all OU 10 IHSSs except IHSSs 170, 174a and 174b
BZ and OUs 5, 6, and 7	BZ	IHSSs located within the BZ	All current IHSSs associated with OUs 2 and 5 except IHSSs 115 and 196; OU 6 except IHSSs 143 and 165; OU 7; and IHSSs 170, 174a, and 174b from OU 10

The former and current OU for each PAC is identified in the PAC writeup.

**Figure 5
Rocky Flats Environmental
Technology Site
Operable Units**

KEY

-  OU 1
-  OU 11
-  OU 15
-  OU 16
-  IA OU
-  BZ OU



Scale = 1: 21,500
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Rocky Flats Environmental Technology Site

Date: 09.26.2005



1.2 Modifications to HRR Evaluation

Since 1992, when the first HRR was released, changes to the RFETS regulatory requirements have resulted in changes to the data evaluation requirements. These changes are described in the following sections.

1.2.1 Data Comparison Values

Data comparison values used in the initial, quarterly, and annual updates of the HRR are specific to the regulatory agreement in force at the time of the data review. The FY2005 HRR Update includes and references this information as appropriate.

Proposed preliminary remediation goals (PPRGs) or preliminary remediation goals (PRGs) were developed for several projects that were characterized in accordance with the IAG. PPRGs were risk-based values calculated for various scenarios to obtain contaminant- and medium-specific levels protective of human health. The risk-based concentrations (RBCs) were based on the residential exposure scenario for the soil ingestion pathway. The PPRGs are described in Programmatic Risk-Based Preliminary Remediation Goals for the Rocky Flats Plant (DOE 1994).

RFCA (DOE et al. 1996) established action levels (ALs) for groundwater, surface soil, and subsurface soil and ALs and cleanup standards for surface water. Surface water ALs and standards included standards associated with surface water use classifications. Groundwater ALs were based on maximum contaminant levels (MCLs) (Tier II) or 100 times MCLs (Tier I). Subsurface soil ALs were based on calculated leachability at Tier I groundwater ALs. For surface soil, Tier I and Tier II ALs were risk based. Portions of RFCA, including the soil ALs, were modified in 2003. The 2003 soil ALs were selected to achieve a lifetime excess cancer risk not greater than 1×10^{-5} for a wildlife refuge worker (WRW). These ALs are listed in RFCA, Attachment 5, Table 3 (DOE et al. 2003).

Prior to the 2003 RFCA modification surface soil was defined as ground surface to 6 inches below ground surface (bgs). The 2003 RFCA Modification established accelerated action requirements based on exceedance of the plutonium-239/240 or americium-241 WRW soil AL within 0 to 3 feet (ft) bgs. These WRW soil ALs were calculated based on a surface soil (0-6 inches) model. Surface soil for nonradionuclides was defined as ground surface to 6 inches below ground surface. A Subsurface Soil Risk Screen (SSRS) was established for soil below 3 ft for plutonium-239/240 and americium-241, and below 6 inches for uranium and nonradionuclides.

Prior to 2000, characterization sampling was conducted in accordance with regulatory agency-approved Sampling and Analysis Plans (SAPs) for a specific IHSS or group of IHSSs within relatively close geographic proximity. To streamline the regulatory review process, existing IA and BZ characterization data were summarized (DOE 2000, 2001), and two SAPs were developed, in accordance with RFCA, to direct the soil characterization activities: the Industrial Area Sampling and Analysis Plan (IASAP) (DOE 2002a) and the Buffer Zone Sampling and Analysis Plan (BZSAP) (DOE 2002b). In 2004, the IA and BZ SAPs were combined into one Sitewide SAP titled the Industrial Area and Buffer Zone Sampling and Analysis Plan (IABZSAP) (DOE 2004). These SAPs, which were approved by the regulatory agencies, include detailed data quality objectives (DQOs) and methods for data analysis. Several other soil data

evaluation methods were used under RFCA (DOE et al. 2003) and include the sum of ratios (SORs), the hot spot methodology, the Stewardship Evaluation, and the SSRS.

SORs

In accordance with the IASAP and BZSAP, SORs were calculated for radionuclides and nonradionuclides for both Tier I and Tier II ALs. In response to the 2003 RFCA Modification, the SOR methodology was changed and described in the IABZSAP. In accordance with the IABZSAP, SORs were calculated for radionuclide and nonradionuclides separately, for surface soil only. Only analytes with concentrations greater than reporting limits (RLs) (for organic) or background means plus two standard deviations (metals and radionuclides) were included. Analytes were included in the SOR for nonradionuclides if their concentration was greater than 10 percent of the WRW soil AL. Additionally, analytes that are commonly found at RFETS that are not generally associated with past operations (aluminum, arsenic, iron, manganese, and polyaromatic hydrocarbons [PAHs]) were excluded.

Stewardship Evaluation

A Stewardship Evaluation was included in the Environmental Restoration (ER) RFCA Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003) notifications to evaluate whether additional removal actions would be required to protect surface water resources. As part of the Stewardship Evaluation the relationship between contaminants in soil and corresponding contaminants in groundwater and surface water were assessed. The locations of current groundwater wells and surface water monitoring stations is shown on Figure 6.

Short- and long-term stewardship recommendations included in closeout or data summary reports are not reiterated in the HRR. Stewardship requirements will be included in the CAD/ROD for the Site.

Subsurface Soil Risk Screen

The 2003 RFCA Modification (DOE et al. 2003) included an SSRS to determine whether additional removal actions would be required to protect surface water resources. The SSRS is described in RFCA Attachment 5, Figure 3. As the title suggests, the SSRS is applicable to subsurface soil only – more than 3 ft bgs for radionuclides, and more than 6 inches bgs for nonradionuclides.

Hot Spot Methodology

A hot spot methodology was developed for RFCA (DOE et al. 2003) accelerated actions and was described in the IASAP and BZSAP and slightly modified in the IABZSAP (DOE 2004). The hot spot methodology was used to determine if action is required for isolated areas of elevated analyte concentrations in surface soil. In the hot spot methodology, the 95% upper confidence limit (UCL) is compared to the WRW ALs and taking into account an area weighting factor. An additional caveat was that hot spots with concentrations three times the WRW soil AL required action regardless of the result of the hot spot methodology calculations.

Figure 6
Rocky Flats Environmental
Technology Site
Groundwater and Surface Water
Monitoring Locations
FY05 IMP

Key

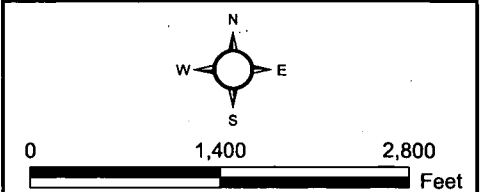
- AOC well
- Boundary well
- Sentinel well
- Decision Document well
- ✱ RCRA well
- ⊙ Evaluation well
- ⊙ Water Level well
- △ Surface water POM (Point of Measurement)
- △ Surface water POE (Point of Evaluation)
- △ Surface water POC (Point of Compliance)
- ✱ Seep

Note:
 As of 8/1/05, some well installation/
 replacements and surface water station
 removals have yet to be completed to
 reach the "final" network shown.

Source:
 FY05, Rev. 1, Integrated Monitoring Plan,
 September 2005.

Standard Map Features

- Pond
- Site boundary
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Gravel road
- Dirt road

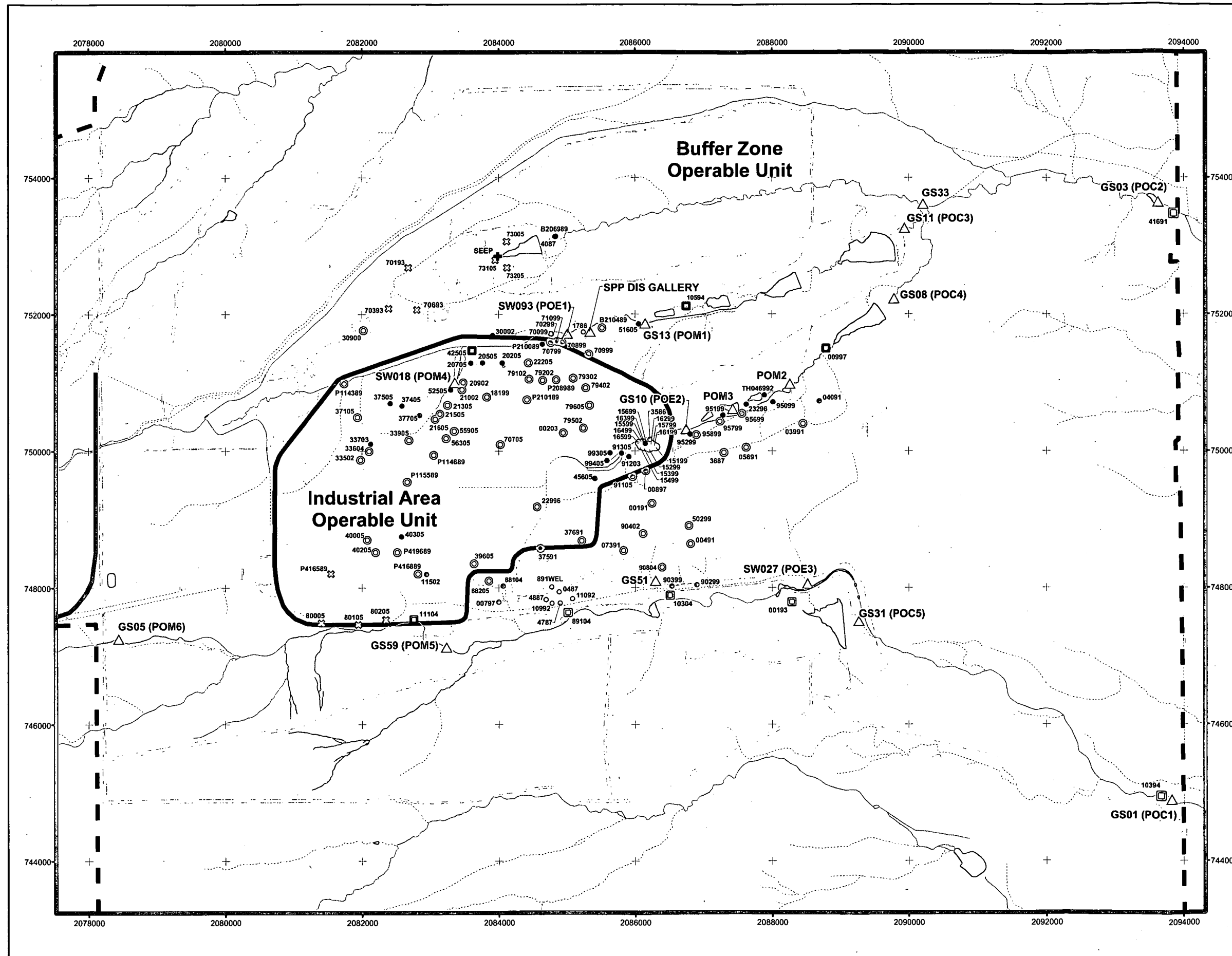


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 Colorado Central Zone
 Datum: NAD 27

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 Rocky Flats Environmental
 Technology Site



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 September 29, 2005



1.3 HRR Format

In the original HRR, the Site was divided into Areas. These Areas form the basis of the PAC numbers. For example, PAC 900-112 is in the 900 Area. These area designations were retained for this Final HRR and are shown on Figure 7. Figures illustrating the IHSSs and PACs in each area are shown on individual figures at the beginning of each Area section.

The format of the FY2005 Final HRR has changed so that the information can be consolidated into a more useful format. Changes are briefly described below.

- Approximate Location - Deleted, new PAC locations are correctly shown on figures.
- Description of Operation or Occurrence – Consolidated into a new section, Historical Summary.
- Physical/Chemical Description of Constituents Released – Consolidated into a new section, Historical Summary.
- Response to Operation or Occurrence – Consolidated into new sections, Historical Summary or IHSS/PAC Investigations as appropriate.
- Fate of Constituents Released to the Environment – Consolidated into new sections, Historical Summary or IHSS/PAC Investigations as appropriate.
- Former Operable Unit number was added.
- HRR Update list was added.
- A brief summary was added.
- A section on IHSS/PAC investigations was added that describes environmental investigations and applicable analytical results.
- No Further Accelerated Action (NFAA) Justification was added to summarize the NFAA justification.

1.3.1 Conventions

Where possible, maps and tables are referenced to the appropriate HRR update, closeout, or data summary report and are not shown in this update. References and discrepancies were checked and corrected as necessary. Document database references from the initial HRR were checked to determine their relevance to the No Further Action (NFA)/NFAA decision. If these references were part of the NFA/NFAA decision they were added to the reference list. All references cited were checked to ensure that they were in the Administrative Record (AR).

There were several name changes since 1992 when the first HRR was released. Names and other designations used in the HRR are the names used at the time of the description or occurrence. For example, some writeups will reference the Rocky Flats Plant (RFP) in the historical section and RFETS in the IHSS/PAC Investigations section.

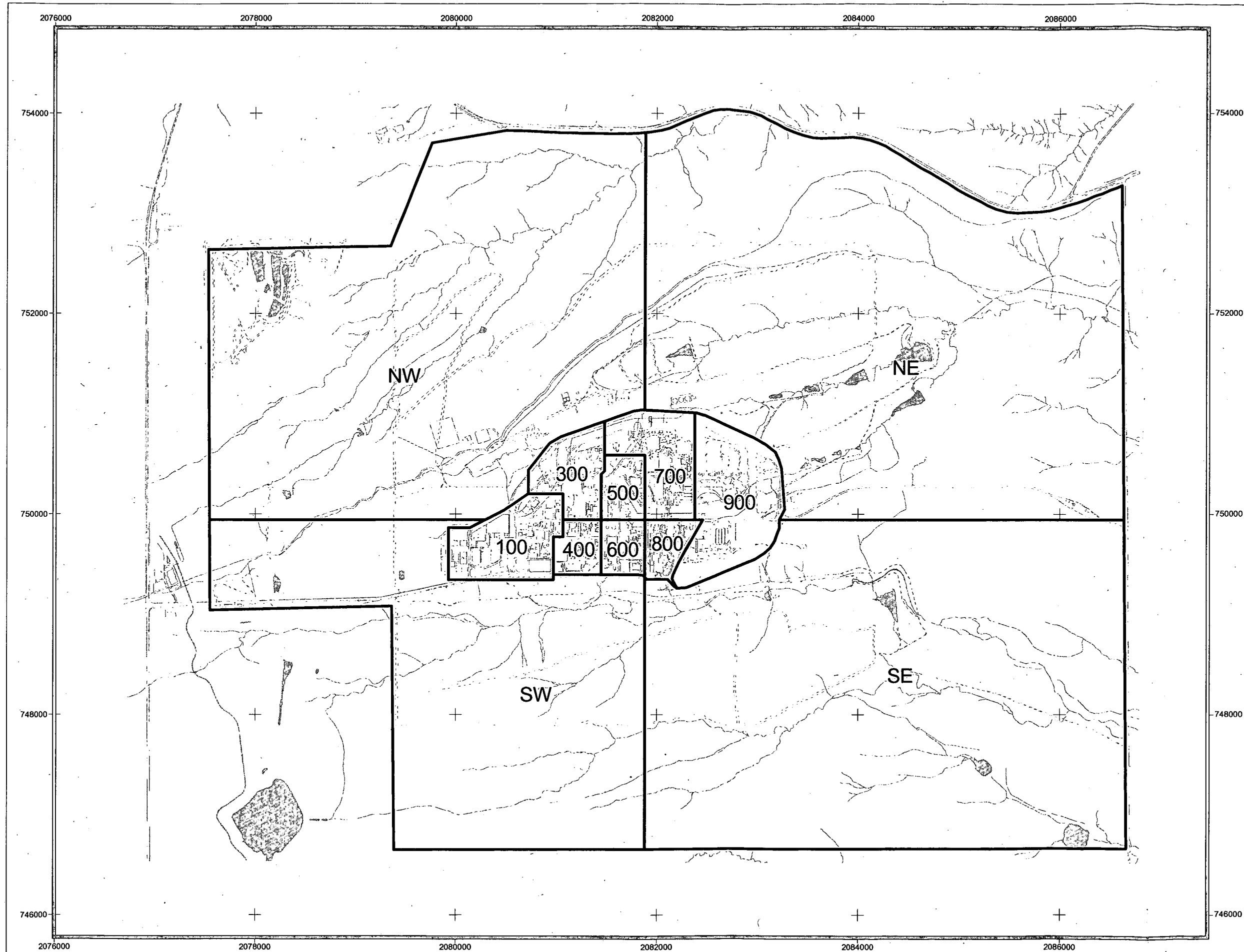






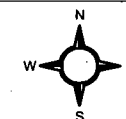


Figure 7
HRR Area Boundaries

KEY

-  Area Boundary
-  Asphalt
-  Dirt Road
-  Stream
-  Lake
-  Building



1000 0 1000 2000 Feet

Scale = 1: 29500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 09.27.05



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RFETS vs RFP

In July 1994, the RFP was renamed the Rocky Flats Environmental Technology Site (RFETS).

NFA vs NFAA

Beginning in FY2003, the NFA designation was changed to No Further Accelerated Action (NFAA) to denote that other actions as determined in the CAD/ROD may be conducted.

CDH vs CDPHE

In a State government agency reorganization, CDH was legislatively abolished and its authority was transferred to a new agency, CDPHE, effective July 1, 1994.

RFFO vs RFPO

DOE Rocky Flats Field Office (RFFO) was used until 2005 when it was changed to Rocky Flats Project Office (RFPO).

1.4 Significant Events

Two significant events occurred at RFETS that are not captured in the FY2005 HRR writeups. These include the following:

- All buildings and structures were removed to at least 3 ft below grade. Building disposition documents are referenced in the FY2005 Final HRR if applicable to the PAC.
- The Site was recontoured and revegetated.

2.0 REFERENCES

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





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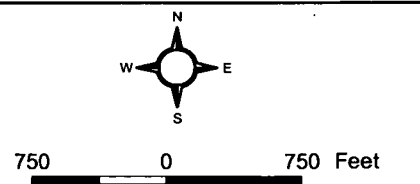
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NE Area

Figure 8
Northeast Buffer Zone Area
IHSSs and PACs

KEY

-  Streams
-  Dirt roads
-  PAC
-  IHSS
-  HRR area
-  Lakes
-  Asphalt
-  Building



Scale = 1: 16500

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.27.05



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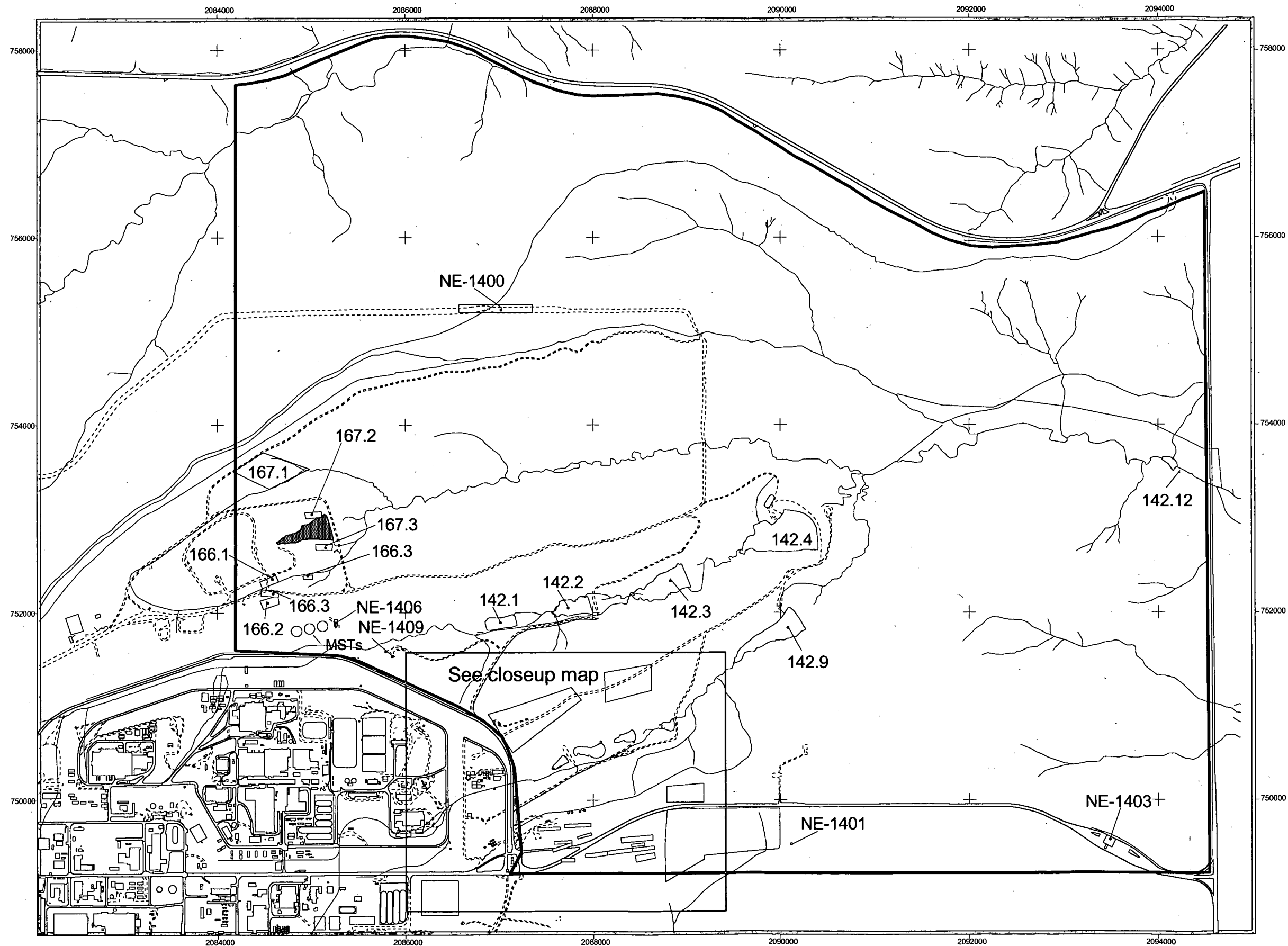
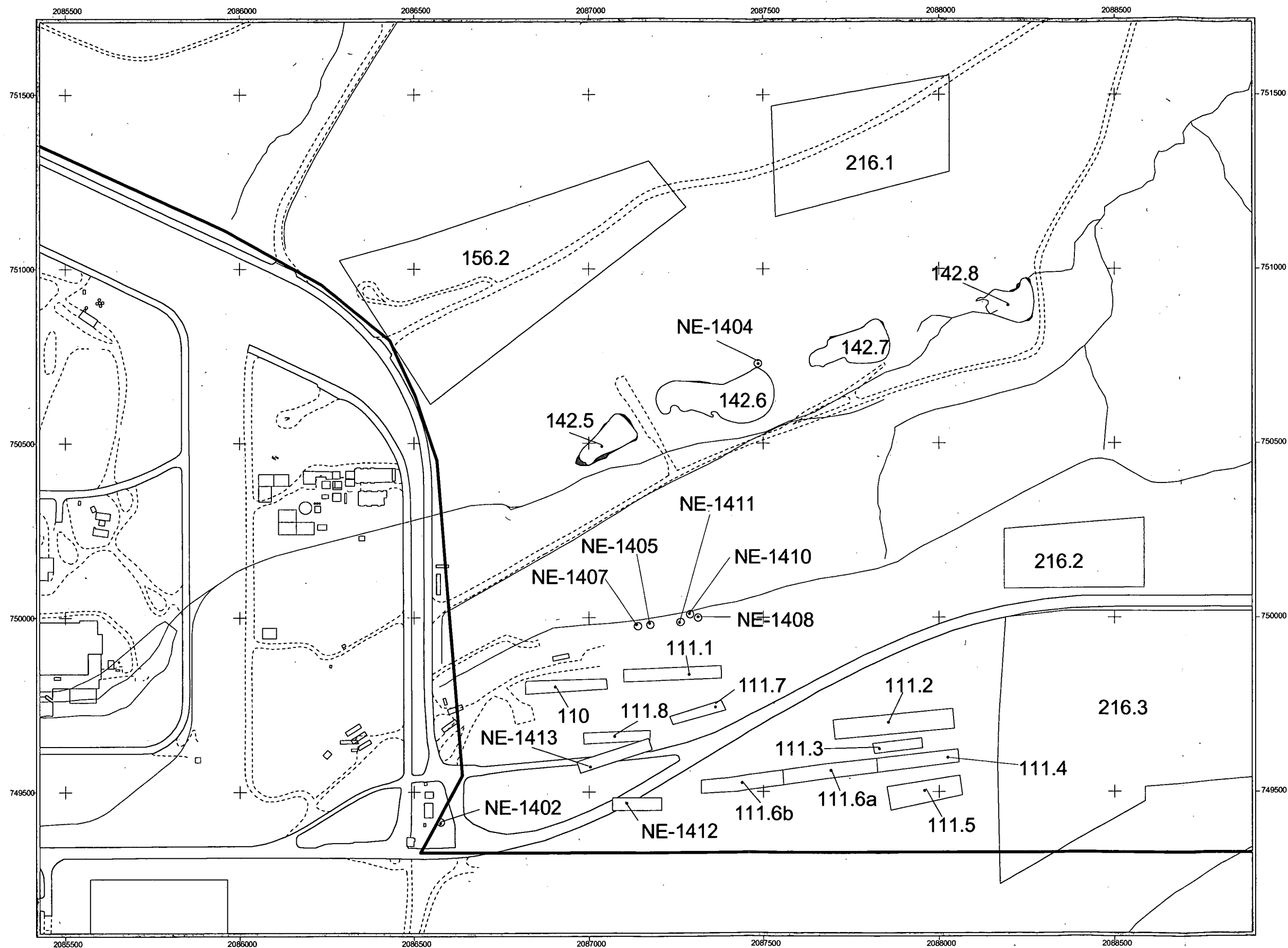








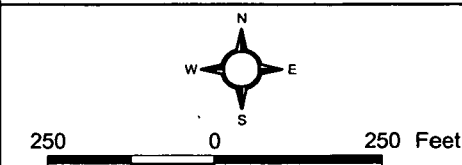


Figure 9
Northeast Buffer Zone Area
IHSSs and PACs Closeup View



KEY

-  Streams
-  Dirt roads
-  PAC
-  IHSS
-  HRR area
-  Lakes
-  Asphalt
-  Building



Scale = 1: 5125

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.27.05



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PAC REFERENCE NUMBER: NE-110

IHSS Number: 110
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: Not Applicable
Unit Name: Trench T-3

This Final Update to the HRR for PAC NE-110 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 110 is summarized in this update. The following HRR volumes contain IHSS 110 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996a);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2000 Annual (DOE 2000a); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

After July 1954 to August 1968

Historical Summary

The term “East Trenches” refers to a group of disposal trenches that are located east of the IA and within approximately 400 ft north and south of the East Access Road. The location of IHSS 110 is shown on Figures 8 and 9. All of the East Trenches have similar operational histories. The trenches are variable in length, with the average length being approximately 250 ft (Dow 1971). The trenches are reported to be approximately 10 ft deep and are provided with 2 ft of soil cover.

The East Trenches (T-3 through T-13 [PACs NE-110, NE-111.1 - NE-11.8, NE-1412, and NE-1413]) were used primarily for the disposal of sanitary wastewater treatment plant sludge, which consists primarily of concentrated organic matter (Dow 1970a). Sludge removed from the wastewater treatment plant was placed on sludge drying beds (PAC 900-1300) and the dried material removed from the sludge drying beds was placed in disposal trenches. An estimated 125,000 kilograms (kg) of sludge is buried in trenches T-2 through T-13 (Rockwell 1983). The sanitary sludge disposal trenches were reported to be approximately 10 ft deep with 2 ft of soil cover (DOE 1992).

Some uranium and plutonium contamination is present in the sludge disposed in the trenches. It is reported that the older sludge would have primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination (Dow 1970a). Total reported long-lived alpha activity present in the sludge ranged from a minimum of 382 picocuries per gram (pCi/g) in August 1964 to a maximum of 3,591 pCi/g in June 1960 (Dow 1970a).

Uranium contamination may also be present in as many as 300 flattened drums that may have been disposed in any of Trenches T-2 through T-11. Contaminated oils that had previously been

held in the drums were burned in Oil Burn Pit No. 2 (PAC 900-153) from March 1957 to mid-1965 (Dow 1970b, 1973).

On at least one occasion it is believed that 2,400 gallons of water and lathe coolant generated in Building 444 was disposed in one of the East Trenches. This waste had an average activity of 150,000 disintegrations per minute per liter (dpm/L). It is believed that this is total alpha activity. The activity of this material was reported as 1.35×10^8 disintegrations per minute (dpm) with approximately 1.3 kg of depleted uranium present in the waste (Dow 1964). It is unknown whether this material was in drums.

Trench T-3 was used primarily for the disposal of sanitary wastewater and sewage treatment plant sludge. Miscellaneous waste including crushed drums, asphalt planking, and construction debris was also disposed of in Trench T-3 (DOE 1996a). An estimated 300 or more flattened drums contaminated with uranium were buried in Trench T-3 (DOE 1996a).

Approximately 2,400 gallons of water and lathe coolant generated in Building 444 was reportedly disposed of in one of the East Trenches (not specifically Trench T-3). This waste had an average activity of 150,000 dpm/L (believed to be total alpha activity). The activity of this material was reported as 1.35×10^8 dpm with approximately 1.3 kg of depleted uranium present in the waste. It is unknown whether this material was in drums (DOE 1992).

IHSS Investigations

OU 2 RFI/RI Activities

IHSS 110 was investigated as part of the OU 2 RCRA Facility Investigation/Remedial Investigation (RFI/RI) in accordance with the OU 2 RFI/RI Work Plans (DOE 1991a, 1991b). Three soil sampling boreholes, four monitoring wells, and eight soil vapor extraction (SVE) boreholes were drilled and sampled to characterize the nature and extent of contamination in Trench T-3. Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, and radionuclides were considered contaminants of concern (COCs) for this IHSS. Results of the Phase II RFI/RI can be found in the OU 2 Phase II RFI/RI Report (DOE 1995).

Surface Soil

Surface soil in OU 2 was investigated by sampling randomly selected plots. One of these plots was in the IHSS 110 area, and was sampled for SVOCs, pesticides/polychlorinated biphenyls (PCBs), metals, and radionuclides. Five SVOCs and all PAHs were detected at relatively low concentrations. No pesticides or PCBs were detected, and calcium was the only metal detected above background. Seven radionuclides were detected above background levels, but all were well below RFCA soil ALs (DOE et al. 1996).

Subsurface Soil

Thirteen VOCs were detected in subsurface samples collected at Trench T-3. Tetrachloroethene was detected in 49 percent of all samples, and chlorinated methanes (methylene chloride, chloroform, and carbon tetrachloride) were each detected in approximately one-third of all samples. Other detected VOCs include 2-butanone, acetone, trichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, and 1,2-dichloroethene. The highest detections were of tetrachloroethene at 13,000,000 micrograms per kilogram ($\mu\text{g/kg}$) and carbon tetrachloride at 700,000 $\mu\text{g/kg}$.

"Free product" was reportedly encountered in one borehole drilled in IHSS 110, and nonaqueous phase liquid (NAPL) was encountered and sampled from an SVE pilot test boring. Results indicated the NAPL was composed chiefly of tetrachloroethene and trichloroethene with lesser amounts of other chlorinated solvents, gasoline and diesel, and SVOCs such as naphthalene, phthalate esters, n-nitrosodimethylamine, phenanthrene, and anthracene.

Bis(2-ethylhexylphthalate) was detected in 100 percent of IHSS 110 subsurface soil samples that were analyzed for SVOCs. One other phthalate ester, two naphthalene compounds, and one PAH were detected at frequencies of approximately 5 to 10 percent.

Metals detected above background levels in IHSS 110 included arsenic and cadmium in 19 percent and 30 percent of samples, respectively. Barium, calcium, lead, manganese, and silver were also elevated in 4.8 to 9.5 percent of samples analyzed.

Plutonium-239/240, americium-241, and radium-226 were detected above subsurface soil background levels in 68 percent, 42 percent, and 40 percent of all samples respectively. Strontium-89/90 and uranium-238 were each elevated in 15.8 percent of samples, while tritium, uranium-233/234, and uranium-235 were elevated in approximately 5 to 10 percent of samples.

Groundwater

Groundwater was sampled in the T-3 and T-4 area. The COCs included VOCs, SVOCs, pesticides, metals, and radionuclides. Chlorinated solvents were the primary contaminants in groundwater, with trichloroethene, carbon tetrachloride, and tetrachloroethene at concentrations greater than RFCA groundwater ALs (DOE et al. 1996). Other contaminants detected included metals and radionuclides at levels exceeding background but not exceeding RFCA groundwater ALs.

The East Trenches Plume Treatment System collects and treats VOC-contaminated groundwater emanating from the area around Trench T-3 and Trench T-4. The treatment system, which was completed in September 1999, consists of a 1,200-ft-long collection system, and two reactive iron treatment cells. That project is described in the Final East Trenches Plume Project Closeout Report (DOE 2000b).

Installation of a mobile SVE and treatment system began in August 1993. The purpose of the treatment system was to evaluate SVE treatment at the Site. Pilot testing was conducted between February and June 1994 (DOE 1994). A full-scale system was never constructed and instead, a source removal was conducted in 1996.

Trench T-3 Source Removal

Results of the OU 2 RFI/RI at Trenches T-3 and T-4 indicated a source of chlorinated solvent contamination in groundwater was present at these trenches in the form of NAPL and contaminated subsurface soil.

Based on these findings, a source removal action was conducted in summer 1996 to excavate and treat contaminated material using low-temperature thermal desorption. This action was in accordance with the Proposed Action Memorandum (PAM) for the Source Removal at Trenches T-3 and T-4, Revision 2, dated March 28, 1996 (DOE 1996b). Approximately 1,706 cubic yards (cy) of VOC-contaminated material was removed from Trench T-3 and treated.

Excavation was completed July 3, 1996, and treatment of Trench T-3 material was completed by July 11, 1996. The completion report for the project details the treatment process, contaminants

removed, condition of the trench following the removal action, and analytical results (DOE 1996c).

Approximately 200 cy of debris (primarily crushed drums) were removed from the trench, treated if contaminated with VOCs, and packaged for off-site disposal. During packaging, 1 to 2 pounds of a black material was released from a drum and spread over a small work area. The material was found to be radioactive and may have been depleted uranium. Two roll-off containers and two waste-crates were used to contain the soil contaminated with this material (DOE 1996c). The containers were shipped to an approved off-site disposal facility.

Soil treated as part of the source removal action was returned to the trench upon review of the post-treatment analytical data to confirm cleanup ALs were met. Debris excavated from the trench was characterized, treated, size-reduced, and containerized. Containerized debris was shipped to the Nevada Test Site (NTS) in September 1997. The source removal action for Trench T-3 removed contamination sources in accordance with cleanup values stipulated in the PAM. Review of the analytical data from this removal action indicated disposal of the 2,400 gallons of water and lathe coolant from Building 444 did not occur in Trench T-3. Analytical data for this project are documented in the Completion Report for the Source Removal at Trenches T-3 and T-4, IHSSs 110 and 111.1 (DOE 1996c).

In 1999, the East Trenches groundwater remediation project was completed which collected and treated a plume of contaminated groundwater from the East Trenches area. That project is described in the Final East Trenches Plume Project Closeout Report (DOE 2000).

Accelerated Action Activities

In 2004, early accelerated action results for samples collected in the backfill overlying Trenches T-6 and T-8 indicated this material was contaminated with plutonium-239/240 at activities exceeding the WRW soil AL (DOE et al. 2003). Because OU 2 and the Trench and Mound Site Characterization sampling programs focused on the contents of the trenches and not the backfill covering them, sampling data for the backfill were limited. Therefore, DOE and the regulatory agencies agreed that additional samples would be collected at Trenches T-3, T-4, T-5, T-10, and T-11 in the A and B depth intervals (0-0.5 ft bgs and 0.5-2.5 ft bgs). Radionuclides were the only analytes. The additional sampling was documented in a Regulatory Contact Record (RCR) dated September 2, 2004, and was conducted as part of the accelerated action sampling for IHSS Group 900-12 (DOE 2005).

For Trench T-3, a total of six samples were collected from three locations. All results were less than RFCA WRW soil ALs (DOE et al. 2003), and therefore no additional remediation was required (DOE 2005).

No Further Action Recommendation

The post-treatment levels of VOCs in the treated soil returned to Trench T-3 were below the thermal desorption unit performance standards specified in the PAM (DOE 1996b), as documented in the completion report (DOE 1996c). Additionally, the excavation verification sample results for the contaminants of concern from Trench T-3 were below the cleanup values stipulated in the PAM (DOE 1996c). These cleanup values were consistent with the RFCA Tier I subsurface soil ALs (DOE et al. 1996). Detectable VOCs in the excavation verification samples for Trench T-3 included carbon tetrachloride in one sample at a concentration of 1.8 parts per million (ppm) and tetrachloroethene in three samples with concentrations ranging from

0.74 ppm to 6.3 ppm. Approved cleanup levels for carbon tetrachloride and tetrachloroethene were 11 ppm and 11.5 ppm, respectively (DOE 1996c).

IHSS 110 was proposed for NFA in the 1997 and 2000 Annual Updates to the HRR because the source removal and treatment goals specified in the PAM (DOE 1996b) were achieved and were consistent with the ALs agreed upon in RFCA (DOE 1996d). In accordance with the PAM (DOE 1996b), the source removal was considered complete because the verification sample concentrations were below cleanup levels and/or completed upon reaching groundwater or bedrock.

The regulatory agencies approved an NFA as proposed for IHSS 110 on October 2, 2001. The NFA agreement, however, was conditional based upon clarification regarding why an original HRR (DOE 1992) reference pertaining to 2,400 gallons of lathe coolant was deleted from the PAC NE-110 Narrative Update in the Annual Update for FY2000. As agreed, an explanation is provided in the Comments section below. Regulatory agency concurrence of NFA status for IHSS 110 was received in 2003 (EPA 2003).

Following accelerated action sampling of trench cover material in 2004, NFAA was again proposed for Trench T-3 in an Addendum to the No Further Action Justification for Trenches T-3 and T-4 (DOE 2005). DOE received EPA (the Lead Regulatory Agency [LRA]) approval of the NFAA status for NE-110 on March 7, 2005 (EPA 2005).

Comments

The PAC Narrative Update for PAC NE-110 submitted in the 1997 Annual Update to the HRR states that no evidence could be found either from physical excavation or analytical data review to support the 1992 HRR reference pertaining to 2,400 gallons of lathe coolant being disposed of in one of the East Trenches. Recent additional review of referenced material supporting the 1992 HRR did not provide further details as to where the lathe coolant was disposed. The 2000 Annual Update removed text regarding the lathe coolant because the PAC Narrative was site-specific to current information regarding Trench T-3. The 1992 HRR for the East Trenches is generally comprehensive, grouping all the information for all the trenches and is not site-specific. It is also possible that the liquid potentially disposed of in one of the East Trenches was diluted sufficiently so that no residual effect was identified, or that the coolant never reached the East Trenches.

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PAC REFERENCE NUMBER: NE-111.1

IHSS Number: 111.1
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: Not Applicable
Unit Name: Trench T-4

This Final Update to the HRR for PAC NE-111.1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 111.1 is summarized in this update. The following HRR volumes contain IHSS 111.1 information:

- Original Report – 1992 (DOE 1992);
- Update Report – 1996 Annual (DOE 1996a);
- Update Report – 1997 Annual (DOE 1997);
- Update Report – 1999 Annual (DOE 1999); and
- Update Report – 2003 Annual (DOE 2003).

Date(s) of Operation or Occurrence

July 1954 to August 1968

Historical Summary

The term “East Trenches” refers to a group of disposal trenches that are located east of the IA and within approximately 400 ft north and south of the East Access Road. The location of Trench T-4 is shown on Figures 8 and 9. All of the East Trenches have similar operational histories. The trenches are variable in length, with the average length being approximately 250 ft (Dow 1971). The trenches are reported to be approximately 10 ft deep and are provided with 2 ft of soil cover.

Not all documents pertaining to the East Trenches have presented a consistent numbering system. Current trench numbering reflects several modifications. Comparisons of a 1983 document to earlier documents indicate a trench that had previously been referred to as Trench T-4 became T-11, while the T-4 designation was applied to an extension of T-3 (Dow 1970a; Rockwell 1983).

The East Trenches (T-3 through T-13 [PACs NE-110, NE-111.1 - NE-11.8, NE-1412, and NE-1413]) were used primarily for the disposal of sanitary wastewater treatment plant sludge, which consists primarily of concentrated organic matter (Dow 1970a). Sludge removed from the wastewater treatment plant was placed on sludge drying beds and the dried material removed from the sludge drying beds was placed in disposal trenches. An estimated 125,000 kg of sludge is buried in trenches T-2 through T-13 (Rockwell 1983).

Some uranium and plutonium contamination is present in the sludge disposed in the trenches. It is reported that the older sludge would have primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination (Dow 1970a). Total reported long-

lived alpha activity present in the sludge ranged from a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960 (Dow 1970a).

Uranium contamination may also be present in as many as 300 flattened drums that may have been disposed in any of Trenches T-2 through T-11. Contaminated oils that had previously been held in the drums were burned in Oil Burn Pit No. 2 (IHSS 153) from March 1957 to mid-1965 (Dow 1970b, 1973a).

Other materials disposed in the East Trenches include approximately 130,000 square feet (ft²) of asphalt planking from the Solar Evaporation Ponds (SEP) (PAC 000-101), which were disposed in T-4 and T-11 in 1963. On at least one occasion it is believed that 2,400 gallons of water and lathe coolant generated in Building 444 was disposed in one of the East Trenches. This waste had an average activity of 150,000 dpm/L. It is believed that this is total alpha activity. The activity of this material was reported as 1.35×10^8 dpm with approximately 1.3 kg of depleted uranium present in the waste (Dow 1964). It is unknown whether this material was in drums.

Trench T-4 was used primarily for the disposal of sanitary wastewater and sewage treatment plant sludge. The sanitary sludge disposal trenches were reported to be approximately 10 ft deep with 2 ft of soil cover (DOE 1992). Miscellaneous waste including crushed drums, asphalt planking, and construction debris was also disposed of in Trench T-4 (DOE 1996a). Flattened drums were identified in Trench T-4 (DOE 1996c).

IHSS Investigations

OU 2 RFI/RI Activities

IHSS 111.1 was investigated as part of the OU 2 RFI/RI in accordance with the OU 2 RFI/RI Work Plans (DOE 1991a, 1991b). Three soil sampling boreholes, four monitoring wells, and eight SVE boreholes were drilled and sampled to characterize the nature and extent of contamination in Trench T-4. VOCs, SVOCs, metals, and radionuclides were considered COCs for this IHSS. The results of the Phase II RFI/RI can be found in the OU 2 FRI/RI Report (DOE 1995).

Surface Soil

Surface soil in OU 2 was investigated by sampling randomly-selected plots. One of these plots was in the IHSS 111.1 area, and was sampled for SVOCs, pesticides/PCBs, metals, and radionuclides. Five SVOCs, all PAHs, were detected at relatively low concentrations. No pesticides or PCBs were detected, and calcium was the only metal detected above background. Seven radionuclides were detected above background levels, but all were well below RFCA soil ALs (DOE et al 1996).

Subsurface Soil

Six VOCs were detected in subsurface samples collected at Trench T-4 (IHSS 111.1). Detected VOCs include 1,1,2,2-trichloroethane, acetone (140 µg/kg), dichloromethane, tetrachloroethene (12,000 µg/kg), trichloroethene (1,000 µg/kg), and toluene; 4,4-DDT and Aroclor-1254 were detected at one location.

Metal COCs included arsenic and cadmium, although most metals were detected at concentrations greater than background.

Plutonium-239/240, americium-241, and uranium-233/234, uranium-235, and uranium-238 were detected above subsurface soil background levels. Maximum activities include plutonium-239/240 at 15 pCi/g, americium-241 at 3 pCi/g, uranium-233/234 at 192 pCi/g, uranium-235 at 11.5 pCi/g, and uranium-238 at 113 pCi/g.

Groundwater

Groundwater was sampled in the IHSS 111.1 area where the COCs included VOCs, SVOCs, pesticides, metals, and radionuclides. Chlorinated solvents were the primary contaminants in groundwater, with trichloroethene, carbon tetrachloride, and tetrachloroethene at concentrations greater than RFCA groundwater ALs. Other contaminants detected included metals and radionuclides at levels exceeding background but not exceeding RFCA groundwater ALs (DOE et al. 1996).

The East Trenches Plume Treatment System collects and treats VOC-contaminated groundwater emanating from the area around Trench T-3 and Trench T-4. The treatment system, which was completed in September 1999, consists of a 1,200-ft-long collection system, and two reactive iron treatment cells. That project is described in the Final East Trenches Plume Project Closeout Report (DOE 2000).

Trench T-4 Source Removal

Results of the OU 2 RFI/RI at both Trenches T-3 and T-4 indicated a source of chlorinated solvents was present at these trenches in the form of NAPL and contaminated soil, and that groundwater had been contaminated as a result.

Based on these findings, a source removal action was conducted in summer 1996 to excavate and treat contaminated material using low-temperature thermal desorption. This action was conducted in accordance with the PAM for the Source Removal at Trenches T-3 and T-4 (Revision 2, dated March 28, 1996 (DOE 1996c). Approximately 2,090 cy of VOC-contaminated material was removed from Trench T-4 (IHSS 111.1) and treated. The completion report for the project details the treatment process, contaminants removed, condition of the trench following the removal action, and analytical results (DOE 1996b).

Approximately 150 cy of debris--primarily crushed drums and miscellaneous construction debris--was also removed from Trench T-4, treated by low-temperature thermal desorption if contaminated with VOCs, and packaged for off-site disposal. The soil treated as part of the source removal action was returned to the trench. Debris excavated from the trench was also treated, size reduced, containerized, and characterized. The containerized debris was shipped to NTS in September 1997.

The source removal action for Trench T-4 resulted in the removal of contamination sources with concentrations greater than the cleanup values stipulated in the PAM with the exception of one area. As detailed in the PAM, excavation at Trench T-4 would stop if bedrock was encountered (DOE 1996b). Bedrock was encountered in the excavation at approximately 20 ft bgs. With concurrence from EPA and CDPHE, excavation ceased and verification samples were collected. The results for these samples indicated the cleanup levels specified in the PAM (DOE 1996b) were achieved in all but 1 of the 16 sampling grids. A level of 22 ppm of trichloroethene was detected in the sample from primary grid 32 (DOE 1996c).

In accordance with an agreement with the regulatory agencies, approximately 250 cy of soil from Trenches T-3 and T-4 with radiological activity greater than RFCA Tier II soil ALs (DOE 1996d) were returned to Trench T-4 within a geotextile liner (DOE 1996c).

The maximum activities of radionuclides in the geotextile were 4.36 pCi/g of uranium-234, 5.75 pCi/g of uranium-235, 358.44 of uranium-238, 3.11 pCi/g of americium-241, and 15.57 pCi/g of plutonium-239/240 (DOE 2003).

Accelerated Action Activities

In 2004, early accelerated action results for samples collected in the backfill overlying Trenches T-6 and T-8 indicated this material was contaminated with plutonium-239/240 at activities exceeding the WRW AL. Because OU 2 and the Trench and Mound Site Characterization sampling programs focused on the contents of the trenches and not the backfill covering them, sampling data for the backfill were limited. Therefore, DOE and the regulatory agencies agreed that additional samples would be collected at Trenches T-3, T-4, T-5, T-10, and T-11 in the A and B depth intervals (0-0.5 ft bgs and 0.5-2.5 ft bgs). Radionuclides were the only analytes. The additional sampling was documented in an RCR dated September 2, 2004, and was conducted as part of the accelerated action sampling for IHSS Group 900-12.

For Trench T-4, a total of six samples were collected from three locations on September 23, 2004. The plutonium-239/240 result for the 0- to 0.5-ft sample collected at CW42-009 was 74.39 pCi/g, which exceeded the WRW AL of 50 pCi/g. The hot spot identified at CW42-009 was remediated in October 2004. A volume of soil occupying 4 ft by 4 ft by 1.3 ft was removed. Five confirmation samples were collected from the excavation and analyzed by alpha spectroscopy. All results were below WRW soil ALs.

No Further Action Recommendation

The SSRS and RFCA Tier II soil ALs were applied to the buried soil that is enveloped in a geotextile liner in this IHSS. Uranium-238 is the only analyte whose concentration in the soil exceeds the soil ALs, and it exceeds the uranium-238 RFCA Tier II soil AL in only one sample (and only by 2 percent). Furthermore, Trench T-4 is not in an area prone to landslides where the soil could become exposed at the surface in the future; and there is a downgradient groundwater collection and treatment system to capture contamination, if any, that may be released at Trench T-4. There is no potential for surface water standards to be exceeded at a Point of Compliance (POC) because of the downgradient groundwater treatment system and the insignificance of the erosional pathway. Accordingly, removal of the buried soil in Trench T-4 was not required.

NFAA for Trench T-4 was proposed in the 1997 Annual Update for the HRR (DOE 1997), and DOE obtained regulatory agency approval of the NFAA status of Trench T-4 on July 9, 1999 (CDPHE and EPA 1999). Comments provided with the approval letter indicate the approval may need to be reviewed if the ALs were revised in the future. New soil ALs, for protection of a WRW, were approved in June 2003 (DOE et al. 2003). The buried soil in Trench T-4 that is enveloped in a geotextile fabric was reassessed using the new ALs and the SSRS.

DOE received EPA (the LRA) and CDPHE approval of NFAA status for PAC NE-111.1 on July 12, 2003 (CDPHE and EPA 2003).

Following accelerated action sampling and soil removal, NFAA was again proposed for IHSS 111.1 in an Addendum to the NFAA Justification for NE-110 and NE-111.1 (DOE 2005). DOE received EPA (the LRA) approval of the Addendum on March 7, 2005 (EPA 2005).

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PAC REFERENCE NUMBERS: NE-111.2, NE-111.3, NE-111.5 – NE-111.8

IHSS Reference Numbers: 111.2, 111.3, 111.5 – 111.8

Current Operable Unit: BZ

Former Operable Unit: 2

IHSS Group: 900-12

Unit Names: Trenches T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11.

This Final Update to the HRR for PACs NE-111.2, NE-111.3, NE-111.5, NE-111.6a, NE-111.6b, NE-111.7, and NE-111.8 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8 is summarized in this update. The following HRR volumes contain information for IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

July 1954 to August 1968

Historical Summary

The term "East Trenches" refers to a group of disposal trenches that were located east of the IA and within approximately 400 ft north and south of the East Access Road. All of the East Trenches have similar operational histories, but some have been written up separately for purposes of the Final Update to the HRR. This writeup pertains only to Trenches T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11 (IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8). Other trenches in the East Trenches are considered separately in this HRR Update because of having been remediated or proposed for NFAA as separate entities. These other trenches include T-3, T-4, T-7, T-12, and T-13 (IHSSs 110, 111.1, and 111.4, and PACs NE-1412 and NE-1413). Figures 8 and 9 indicate the locations of the trenches.

The trenches are variable in length, with the average length being approximately 250 ft (Dow 1971). The trenches are reported to be approximately 10 ft deep and are provided with 2 ft of soil cover.

The East Trenches (T-3 through T-13) were used primarily for the disposal of sanitary wastewater treatment plant sludge, which consisted primarily of concentrated organic matter (Dow 1970a). Sludge removed from the wastewater treatment plant was placed on sludge drying beds and the dried material removed from the sludge drying beds was placed in disposal trenches. An estimated 125,000 kg of sludge is buried in trenches T-2 through T-13 (Rockwell 1983).

Uranium and plutonium contamination were in the sludge. Total reported long-lived alpha activity present in the sludge ranged from a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960 (Dow 1970a). Uranium contamination may also be present in 300 flattened drums that may have been disposed in any of East Trenches.

Other materials that may be present in the East Trenches including: contaminated oils that had previously been held in the drums that were burned in Oil Burn Pit No. 2 (PAC 900-153), approximately 130,000 ft² of asphalt planking from the redesign of SEP Pond 207A (PAC 000-101), lathe coolant generated in Building 444 with an average activity of 150,000 dpm/L, depleted uranium, scrap metal, and junk were buried in Trench 9a (Rockwell 1983).

Between 1977 to 1983, soil samples were collected from Trenches T-9a, T-10, and T-11. Soil from Trench T-9a was found to vary from 0.40 to 68 pCi/g in plutonium activity, and from 2.4 to 450 pCi/g uranium activity. Trench T-10 was found to contain from 0.18 to 14 pCi/g plutonium activity and from 40 to 126 pCi/g uranium activity. Trench T-11 was found to contain 4.5 to 50 pCi/g plutonium activity and 0.9 to 158 pCi/g in uranium activity (Rockwell 1983).

IHSS Investigations

OU 2 RFI/RI Activities

In accordance with the OU 2 RFI/RI Work Plans (DOE 1991a, 1991b), the East Trenches were characterized during the Phase I and Phase II OU 2 RFI/RI Investigations, but these investigations did not provide the data necessary to determine dimensions and boundaries of the trenches, or areas of high concentration of contaminants in the trenches (DOE 1995a). For example, while at least one borehole was drilled into each trench, drilling through the base of the trenches into the underlying soil excluded because of the uncertainties in the trench contents, and in whether the area beneath the trenches was contaminated. Drilling through the trenches could potentially have created pathways for contaminants to migrate downward into uncontaminated areas.

Trenches and Mound Site Characterization Activities

In 1995 and 1996, further investigations of the East Trenches area were conducted in accordance with the Trenches and Mound Site Characterization Work Plan (DOE 1995b). This investigative program used several approaches to meet project objectives: historical data were compiled to identify potential contaminants, trench location, and size; aerial photographs were examined to identify disturbed areas, verify trench dimensions, and determine dates of operation; a visual survey was conducted to identify features on the ground and to lay out a geophysical sampling grid; two electromagnetic surveys were conducted to delineate magnetic anomalies and trench boundaries; ground penetrating radar (GPR) surveys were conducted to better determine trench depth and extent; soil gas surveys were conducted to identify and delineate VOC plumes; and subsurface soil sampling was conducted to verify soil gas survey results and to better define the extent of metal and radionuclide contamination (DOE 1996).

With regard to Trenches T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11 (IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8), the Trenches and Mound Site Characterization Report concluded that there were no contaminant concentrations or activities in subsurface soil exceeding the applicable 1996 RFCA soil ALs (DOE et al. 1996), and no groundwater contaminant plumes originating from these particular trenches. Upper hydrostratigraphic unit (UHSU) monitoring wells installed in the T-5 through T-9a/b area were frequently dry, indicating the frequent absence of a groundwater pathway. Based on the absence of both sources at Trenches T-5, T-6, and T-8 through T-11 and viable pathways, it was recommended that these trenches not be remediated.

Accelerated Action Activities

Accelerated action sampling in accordance with BZSAP Addendum #BZ-04-2 (DOE 2003b) was conducted at Trenches T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11 in order to fill gaps in the existing data (DOE 2003b). Soil from Trenches T-6, T-8, T-9a, and T-9b was collected at multiple depths and analyzed for multiple analyte groups because limited historical data were available. Soil from Trenches T-5, T-10, and T-11 was sampled only from the surface and near-surface intervals (less than 2.5 ft bgs) because sufficient historical data existed for deeper soil. Radionuclides were the only COCs identified for these samples (DOE 2005).

IHSS 111.2, Trench T-5

Based on results of the OU 2 RFI/RI, seven VOCs were detected in subsurface soil including acetone at a maximum concentration of 2,400 µg/kg and 1,2-dichloroethane at 100 µg/kg. All other VOC concentrations were close to detection limits. SVOC concentrations were also low. The maximum arsenic concentration was 14.6 milligrams per kilogram (mg/kg) and the maximum cadmium concentrations was 3.8 mg/kg. Americium-241, cesium-137, and plutonium-239/240 were the only radionuclides at activities greater than background with maximum activities of 0.53, 0.1, and 6 pCi/g, respectively (DOE 1995).

The results of the Trenches and Mound Site characterization (DOE 1996) indicated the maximum concentrations of arsenic was 14.6 mg/kg, nickel was 173 mg/kg, and cadmium was 20.8 mg/kg. The maximum radionuclide activities were 2.09 pCi/g of americium-241 and 11.8 pCi/g of plutonium-239/240.

Results of accelerated action soil sampling (DOE 2005) indicated that maximum activities or radionuclides were americium-241 at 1.30 pCi/g, plutonium-239/240 at 5.54 pCi/g, uranium-234 at 3.84 pCi/g, uranium-235 at 0.27 pCi/g, and uranium-238 at 3.84 pCi/g in soil from 0 to 3 ft below the surface. Soil removal was not required at Trench 5.

IHSS 111.3, Trench T-6

Based on results of the OU 2 RFI/RI (DOE 1995), five VOCs were detected. Toluene had the highest concentration at 56 µg/kg. The rest of the VOCs and SVOCs were near detection limits. All metals were at concentrations less than background. The maximum activity of americium-241 was 0.042 pCi/g, and the maximum activity of plutonium-239/240 was 0.39 pCi/g.

The maximum activities of radionuclides found during the Trenches and Mound Site characterization (DOE 1996) were 0.04 pCi/g of americium-241, 0.39 pCi/g of plutonium-239/240, 6.93 pCi/g of uranium-233/234, and 0.23 pCi/g of uranium-235.

Accelerated action soil sampling results (DOE 2005) indicated RFCA WRW soil AL (DOE et al. 2003) exceedances were present in soil collected from one sampling location at Trench T-6. Plutonium-239/240 was present at 237.0 pCi/g from 0 to 0.5 ft bgs, at 195.68 pCi/g from 0.5 to 2.5 ft bgs, and 123.18 pCi/g from 2.5 to 4.5 ft bgs. Based on characterization results, a RFCA (DOE et al. 1996) accelerated action to remove plutonium-239/240 contaminated soil from Trench T-6 (IHSS 111.3) was conducted in accordance with ER RSOP Notification #04-13 (DOE 2004). The Trench T-6 excavation was approximately 115 ft by 23 ft by 3 ft (DOE 2005). After soil removal activities, plutonium-239/240 activities ranged from 3.41 to 14.12 pCi/g in soil from 0 to 3 ft bgs.

IHSS 111.5, Trench T-8

Nine VOCs and SVOCs were detected during the Phase II RFI/RI (DOE 1995), however, other than acetone (maximum concentration of 1,700 µg/kg) their concentrations were near or below quantification limits. Metals were detected with maximum concentrations of 28.4 mg/kg of arsenic, 5.6 mg/kg of cadmium, and 45.6 mg/kg of lead. Americium-241, plutonium-239/240, and uranium-235 had maximum activities of 0.05, 0.24, and 0.13 pCi/g, respectively.

Maximum concentrations of metals greater than background values detected in soil characterized during the Trenches and Mound Site investigation include 30.8 mg/kg of arsenic, 5.5 mg/kg of cadmium, 193 mg/kg of chromium, and 45.6 mg/kg of lead. Additionally, maximum radionuclide activities include 104.9 pCi/g of americium-241, 642.4 pCi/g of plutonium-239/240, 9.38 pCi/g of uranium-233/234, and 0.37 pCi/g of uranium-235 (DOE 1996).

Accelerated action characterization results (DOE 2005) indicated that plutonium-239/240 activities exceeded the RFCA WRW soil ALs at 0.5 to 2.5 (84.59 pCi/g), 2.5 to 4.5 (756.30 pCi/g), and 4.5 to 6.5 ft (695.40 pCi/g) bgs. Americium-241 activities also exceeded the RFCA WRW soil at 132.70 pCi/g at 0.5 to 2.5 ft and at 122.00 pCi/g at 2.5 to 4.5 ft bgs. Based on characterization results a RFCA (DOE et al 1996) accelerated action to remove plutonium-239/240 and americium-241 contaminated soil from Trench T-8 (IHSS 111.5) was conducted in accordance with ER RSOP Notification #04-13 (DOE 2004). The Trench T-8 excavation was approximately 122 ft by 20 ft by 3 ft (DOE 2005). Residual contamination in Trench T-8 includes plutonium and americium activities exceeding the RFCA WRW soil AL (DOE et al. 2003) at depths ranging from 3 to 10 ft bgs. Americium-241 is present at an activity of 104.9 pCi/g below 3 ft. Plutonium-239/240 is present at depths greater than 3 ft at three locations and ranges from 98.84 to 642 pCi/g. These exceedances do not require remediation under RFCA because they are greater than 3 ft bgs. Trench T-8 also contains a chromium exceedance (4,600 mg/kg) in the 3 to 8 ft depth interval.

IHSSs 111.6 and 111.6b, Trenches 9a and 9b

Twelve VOCs and eight SVOCs were detected in subsurface soil samples during the Phase II RFI/RI (DOE 1995). The maximum concentrations are 230 µg/kg of total xylenes, 47 µg/kg of toluene, 710 µg/kg of acetone, 90 µg/kg of 1,2-dichloroethene, 34 µg/kg of 1,2-dichloroethane; and 570 µg/kg of pyrene. All other VOCs and SVOCs were close to or less than quantification limits. One sample contained soil with 250 µg/kg of Aroclor-1254. Maximum metal concentrations were 18.5 mg/kg of arsenic, 3.6 mg/kg of cadmium, and 33.6 mg/kg of lead. The maximum activities of radionuclides included americium-241 at 0.04 pCi/g, plutonium-239/240 at 2.88 pCi/g, uranium-233/234 at 0.18 pCi/g, uranium-235 at 0.18 pCi/g, and uranium-238 at 2.95 pCi/g.

During the Trenches and Mound characterization (DOE 1996), one sample contained 16,000 µg/kg of trichloroethene that exceeded the RFCA Tier I subsurface soil AL (DOE et al. 1996). Maximum concentrations of metals greater than background included 22.8 mg/kg of arsenic, 3.6 mg/kg of cadmium, 39.5 mg/kg of lead, 1.4 mg/kg of mercury, and 219 mg/kg of silver. Americium-241 was detected at a maximum activity of 0.04 pCi/g, plutonium-239/240 at 0.15 pCi/g, uranium-233/234 at 11.4 pCi/g, uranium-235 at 0.53 pCi/g, and uranium-238 at 11.95 pCi/g.

Accelerated action characterization results (DOE 2005) indicated that americium-241 activities ranged from 0.50 to 6.8 pCi/g and plutonium-239/240 activities ranged from 3.69 pCi/g to 38.73 pCi/g. Benzo(a)pyrene at one location concentration exceeded the RFCA WRW soil AL (DOE et al. 2003) at 0.5 to 2.5 ft bgs with a concentration of 4,700 µg/kg. Based on the elevated measurements comparison and SSRS, this exceedance did not require remediation under RFCA (DOE 2005).

IHSS 111.7, Trench 10

The highest concentrations of VOCs found during the Phase II RFI/RI investigation (DOE 1995) were 190 µg/kg of 1,1,1-trichloroethane and 270 µg/kg of acetone. The maximum concentration of other analytes greater than background were 6.2 mg/kg of cadmium. The maximum activities of radionuclides greater than background were 0.03 pCi/g of americium-241, 0.28 pCi/g of plutonium-239/240, and 1.5 pCi/g of uranium-238.

Maximum concentrations and activities detected during the Trenches and Mound Site characterization (DOE 1996) include 6.1 mg/kg of cadmium, 7.67 pCi/g americium-241, and 34.79 pCi/g of plutonium-239/240.

Accelerated action characterization results (DOE 2005) indicated americium-241 was detected at a maximum activity of 2.47 pCi/g, plutonium-239/240 at 14.06 pCi/g, uranium-234 at 3.08, uranium-235 at 0.19 pCi/g, and uranium-238 at 3.08 pCi/g in soil between 0 and 3 ft in depth.

IHSS 111.8, Trench 11

Nine VOCs and four SVOCs were detected in subsurface soil samples collected as part of the OU 2 Phase II RFI/RI (DOE 1995). The maximum concentrations were 360 µg/kg of acetone, 430 µg/kg of toluene, 130 µg/kg of 1,1,1-trichloroethene, 210 µg/kg of methylene chloride, 130 µg/kg of 2-butanone, and 630 µg/kg of bis(2-ethylhexyl)phthalate. Other VOCs and SVOCs were at or below quantitation limits. Americium-241 and plutonium-239/240 were greater than background with maximum activities of 0.05 pCi/g and 0.25 pCi/g, respectively.

Maximum concentrations of metals found during the Trenches and Mound Site characterization include 3.6 mg/kg of cadmium and 163 mg/kg of nickel. The maximum activities of radionuclides include 0.07 pCi/g americium-241 and 0.25 pCi/g of plutonium-239/240 (DOE 1996).

Accelerated action characterization results (DOE 2005) indicated americium-241 was detected at a maximum activity of 0.50 pCi/g, plutonium-239/240 at 2.84 pCi/g, uranium-234 at 3.48 pCi/g, uranium-235 at 0.24 pCi/g, and uranium-238 at 3.48 pCi/g in soil between 0 and 3 ft in depth.

No Further Action Recommendation

In 2003, prior to accelerated action, Trenches T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11 (IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8) were recommended for NFAA designation based on the conclusions of the Trenches and Mound Site Characterization Report (DOE 2003b; 1996). All subsurface soil COC concentrations and activities were less than 1996 RFCA ALs. Plutonium was present in the buried waste at a maximum concentration of 642 pCi/g, which is well below the 3 nanocuries per gram (nCi/g) limit that triggers further evaluation and potential soil removal. There was little potential for contaminated runoff because the sites were located in a relatively flat area and the waste was buried. The VOC concentrations

in the East Trenches waste material were very low, and accordingly, the trenches did not appear to be sources for groundwater contamination. The dry conditions at Trench T-5, T-6, T-8, T-9a and T-9b would substantially limit any contaminant migration via groundwater. Contaminants observed in groundwater at Trenches T-10 and T-11 appeared to originate from other sources and are captured by the East Trenches Passive Reactive Barrier system.

Following accelerated action, Trenches T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11 (IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8) were again proposed for NFAA as part of the Closeout Report for IHSS Group 900-12 (East Trenches).

DOE received approval from EPA (the LRA) of the NFAA status of IHSSs 111.2, 111.3, 111.5, 111.6a, 111.6b, 111.7, and 111.8 on February 23, 2005 (EPA 2005).

Comments

None

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PAC REFERENCE NUMBER: NE-111.4

IHSS Number: 111.4
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: NE-1
Unit Name: Trench T-7

This Final Update to the HRR for PAC NE-111.4 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 111.4 is summarized in this update. The following HRR volumes contain IHSS 111.4 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003).

Date(s) of Operation or Occurrence

1962 to 1963

Historical Summary

Trench T-7 was located approximately 1,400 ft east of the inner east guard gate and 290 ft south of the East Access Road as shown on Figures 8 and 9. It is one of several trenches referred to as the East Trenches (T-3 through T-11; PACs NE-110 and 111.1 through 111.8) (DOE 1992). The trenches were used primarily for the disposal of sanitary wastewater treatment plant sludge. Flattened empty drums and asphalt planking from the SEP, both of which may have been contaminated with uranium and plutonium, also may have been disposed in the trenches. In addition, it is believed that water and lathe coolant generated in Building 444 was disposed in one of the East Trenches. Waste disposal in the trenches occurred between July 29, 1954 and August 14, 1968. Approximate ranges for individual trenches have been inferred from analysis of aerial photographs, but exact dates for individual trenches are unknown. No documentation has been found that records the exact time frame during which any particular trench was receiving waste (DOE 1992).

Trench T-7 was approximately 115 ft long, 14 to 16 ft wide and 12 ft in depth (based on 10 ft of waste material plus 2 ft of soil cover). The volume of waste material in the trench is estimated at 798 cy (DOE 2003a).

Some uranium and plutonium contamination was present in the sludge disposed in the trenches. It is reported that the older sludge would have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge was reported between a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960. Uranium contamination may also be present in flattened drums that may have been disposed in any of Trenches T-2 through T-11 following burning of the contaminated oils that had been held in the drums. Burning of the contaminated oils was done in Oil Burn Pit No. 2 (PAC 900-153) from March 1957 to mid-1965, and not in the

trenches. These flattened drums, estimated at up to 300 total, could be present in any of Trenches T-3 through T-11 (DOE 1992).

It is believed that 2,400 gallons of water and lathe coolant generated in Building 444 was also disposed in one of the East Trenches. This waste had an average activity of 150,000 dpm/L. It is believed that this is total alpha activity. The activity of this material was reported as 1.35×10^8 dpm with approximately 1.3 kg of depleted uranium present in the waste. It is unknown whether this material was disposed in drums.

IHSS Investigations

OU 2 RFI/RI Activities

Subsurface Soil

In accordance with the OU 2 RFI/RI work plans (DOE 1991a, 1991b), seven boreholes were drilled and sampled to characterize the nature and extent of contamination at Trench T-7. The target analytes were VOCs, SVOCs, metals, and radionuclides. Acetone was detected in more than 60 percent of the 43 samples analyzed for VOCs, and 1,2-dichloroethane was detected in 35 percent. Toluene, a suspected field contaminant, was detected in 28 percent of all samples. Other detections included 1,1,2,2-tetrachloroethane, chloroform, tetrachloroethene, and xylenes, each detected in fewer than 5 percent of all samples.

Of 32 samples analyzed for SVOCs, di-n-butylphthalate was detected in 59 percent and N-nitrosodimethylamine was detected in 28 percent. However, both of these compounds were also detected in laboratory blank samples. Bis(2-ethylhexyl)phthalate and pentachlorophenol were each detected in one sample.

Arsenic, cadmium, calcium, and zinc were the only metals detected in excess of background levels. The mean of the five arsenic detections slightly exceeded the 22.2 mg/kg WRW soil AL (DOE et al. 2003) for arsenic. All other metals concentrations were below WRW soil ALs.

Plutonium-239/240 and americium-241 were each detected in at least 16 out of 40 samples, but none of the activities exceeded the WRW soil ALs for these compounds. Strontium-90 was detected in 4 of 6 samples in which it was analyzed. There is no established soil background level or WRW soil AL for strontium-90 at RFETS.

Surface Soil

No SVOCs, pesticides, or PCBs were detected in surface soil samples collected in the T-7 area, and no metals were detected at concentrations exceeding Site background. Radionuclide activities were slightly in excess of background levels but were well below WRW soil ALs.

Groundwater

Only limited UHSU groundwater samples could be collected in the vicinity of Trench T-7 during the OU 2 RFI/RI, because the well was dry in that area throughout much of the investigation time frame. No organics, radionuclides, cyanide, or nitrate/nitrite were detected at levels exceeding RLs or background in that sample. Two lower hydrostratigraphic unit (LHSU) monitoring wells were sampled on a quarterly basis in the T-7 area. Aluminum, iron, and uranium-235 were detected in both wells at levels exceeding background and lead was detected in one well at concentrations exceeding background.

Trenches and Mound Site Characterization Activities

In accordance with the Trenches and Mound Site Characterization Work Plan (DOE 1995), IHSS 111.4 was further characterized. The goal of the program was to delineate those areas of the trenches with high concentrations of VOCs so that those areas could be targeted for remediation. Geophysical surveys and analysis of historical aerial photographs were used to delineate trench boundaries and guide the placement of sampling locations. Results of this investigation are described in the Draft Trenches and Mound Site Characterization Report (DOE 1996).

Three boreholes were drilled within the boundaries of Trench T-7. Tetrachloroethene was detected at 14,000 µg/kg, which exceeded the then-applicable RFCA subsurface soil AL. No other organics were detected above their ALs or PRGs. Cadmium, calcium, chromium, nickel, silver, sodium, and strontium were detected at concentrations exceeding background levels but below PRGs for subsurface soil. Americium-241, plutonium-239/240, radium-226, radium-228, and uranium-233/234 activities in subsurface soil exceeded PRGs for subsurface soil. In particular, americium-241 was detected at 208.7 pCi/g and plutonium-239/240 was detected at 1744 pCi/g. Groundwater sampled in the Trench T-7 area contained carbon tetrachloride at 9 µg/L, tetrachloroethene at 320 micrograms per liter (µg/L) and trichloroethene at 22 µg/L. The RFCA Tier II groundwater ALs (DOE et al. 1996) for all of these compounds are 5 µg/L.

Accelerated Action Activities

In 2004, early accelerated action results for samples collected in the backfill overlying trenches T-6 and T-8 indicated this material was contaminated with plutonium-239/240 at activities exceeding the RFCA WRW soil AL (DOE et al 2003). Because OU 2 RFI/RI and the Trench and Mound Site Characterization sampling programs focused on the contents of the trenches and not the backfill covering them, sampling data for the backfill were limited. Therefore DOE and the regulatory agencies agreed that additional samples would be collected in the backfill overlying several of the East Trenches. Radionuclides were the only COCs. The sampling was conducted under BZSAP Addendum #BZ-04-02 and is documented in an ER RCR dated October 21, 2004. Samples were collected in the A and B depth intervals (0-0.5 ft bgs and 0.5-2.5 ft bgs) from three biased sampling locations.

Analytical results indicated radionuclides were present at activities less than RFCA WRW soil ALs with two exceptions. At sampling location CZ41-011, plutonium-239/240 was detected at 65.72 pCi/g in the A interval (0-0.5 ft bgs) and at CZ41-010, plutonium-239/240 was detected 108.59 pCi/g in the B interval (0.5-2.5 ft bgs).

The two hotspots identified in Trench T-7 soil were remediated in November 2004. This RFCA (DOE et al. 1996) action was conducted in accordance with the ER RSOP and an ER RCR dated November 10, 2004. The initial excavation at each hotspot was 5 ft by 5 ft. The eastern hotspot (CZ41-011) was initially excavated to 0.5 ft, and the western hotspot (CZ41-010) was excavated to 3 ft. Eight confirmation samples were collected on November 24, 2004, from the sidewalls of each excavation. Gamma spectroscopy results indicated all plutonium-239/240 activities were below the RFCA WRW soil AL (DOE et al. 2003), but subsequent alpha spectroscopy results indicated confirmation samples from the northern and southern sidewalls of the eastern hotspot had plutonium-239/240 activities exceeding the RFCA WRW soil AL (DOE et al. 2003). Additional excavation therefore occurred at the eastern hotspot on January 6 and 10, 2005. Confirmation samples were again collected at the northern and southern sidewalls and both gamma and alpha spectroscopy results were less than RFCA WRW soil AL (DOE et al. 2003).

No Further Accelerated Action Recommendation

Based on the results of OU 2 RFI/RI sampling and the Trench and Mound Characterization, an NFAA justification was prepared for Trench T-7 in May 2003 (DOE 2003a). Plutonium is present in the buried waste at a maximum concentration of 2.45 nCi/g, which is below the 3 nCi/g limit that triggers further evaluation and potential soil removal. There is little potential for contaminated runoff because the site is located in a relatively flat area and the waste is buried. The dry conditions at Trench T-7 will substantially limit contaminant migration via groundwater. When groundwater is present, contaminants migrating to the north will be captured by the East Trenches plume treatment system. VOC contamination immediately south of Trench T-7 has not been observed; however, should contaminants migrate in this direction, degradation is expected to prevent discharge of these contaminants to surface water. DOE received EPA approval of NFAA for Trench T-7 (IHSS 111.4) on June 12, 2003.

Following accelerated action sampling and remediation in the backfill overlying Trench T-7, an Addendum to the earlier NFAA Justification document was prepared (DOE 2005). DOE received EPA approval of the Addendum on February 23, 2005.

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PAC REFERENCE NUMBERS: NE-142.1 – 142.4

IHSS Number: 142.1 – 142.4
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: NE-1
Unit Name: Walnut Creek (Priority) Drainage

This Final Update to the HRR for PACs NE-142.1 through NE-142.4 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS NE-142.1 – NE-142.4 is summarized in this update. The following HRR volumes contain NE-142.1 – NE-142.4 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1997 Annual (DOE 1997).

Date(s) of Operation or Occurrence

January 1954 to Present

Historical Summary

The A-Series Ponds are located in the North Walnut Creek Drainage as shown on Figures 8 and 9. The A-Series Ponds were designed and constructed to collect surface runoff and allow for management and controlled off-site discharge of water. The ponds served three main purposes: storm water management, holding water for sampling and treatment (if necessary) and emergency spill control if a spill could not be adequately managed without use of the ponds. Because the Site is no longer in operation the ponds are no longer used for emergency spill control.

In the A-Series Ponds, Ponds A-1 and A-2 were considered nondischarge ponds and were seldom released. During periods of heavy rain, or if water was needed downstream, there was an occasional movement of water. North Walnut Creek was routed around the upper A-Series Ponds so flow went into Pond A-3 and then into Pond A-4. Pond A-4, the Terminal Pond, is the largest of the surface water ponds on Rocky Flats, and discharge occurs on a regular basis. The ponds currently operate in this configuration.

Pond A-5 (PAC NE-141.12) is a small pond west of where Walnut Creek crosses Indiana Street. Pond A-5 retains several thousand gallons but is not a Site retention pond in the same sense as A-4 or B-5 because it cannot be used to retain a storm surge and regulate discharge.

In the past, wastewater streams were directly or indirectly released to the A-Series Drainage (the A-Series Ponds in the North Walnut Creek Drainage)(nonemergency and nonspill-related) during the history of RFETS. Building 771 waste discharged to a storm drain north (PAC 700-143) and west of Building 771, and flowed to the A-Series Drainage. Waste streams included untreated wastewater from Building 771, cooling tower and roof drain water from Building 774, Building 774 evaporator condensate water, and footing drain flows. The Building 771 wastewater primarily consisted of decontamination laundry wastewater; however, it also contained water

from the analytical laboratory, radiography operations, personnel decontamination room, and storm runoff. In 1971, it was reported that the Building 774 evaporator condensate drain typically released 20,000 gallons of water per day at 100 dpm/L, with 5 milligrams per liter (mg/L) of nitrate.

In 1973, it was estimated that 14 microcuries (μCi) of plutonium-239/240 were present in Pond A-1 sediment. In response to this problem, a series of trenches and pumps to collect contaminated groundwater and seepage was constructed between the SEP (PAC 000-101) and the A-Series Drainage. Other response actions to contamination in the A-Series Drainage included the removal of contamination near the Building 771 Outfall (PAC 700-143), rerouting of discharges to other facilities, and elimination of flows from Building 774.

Results of the routine predischage sampling for Pond A-4, on November 3, 2004, yielded elevated americium-241 activities. These elevated activities were seen in samples collected by both DOE and CDPHE. These activities exceeded the RFCA surface water ALs for americium-241, and as a result the pond water was not discharged.

In early December, 2004, DOE collected a number of surface water samples in the North Walnut Creek Drainage to investigate the source of elevated americium-241 activity noted in Ponds A-3 and A-4. The sampling was concentrated in the area where Buildings 771/774 formerly stood. One sample, collected from a pool of water in an Original Process Waste Line (OPWL) manway, northwest of former Building 771, contained elevated americium-241 activities without significant plutonium-239/240 activity, which is the same americium/plutonium signature that was observed in Ponds A-3 and A-4. This manway receives the outfall from former Building 771.

Based on this sampling result, actions to stop any additional water from this source from entering North Walnut Creek were taken. The manway, which had been covered with soil as a result of the site grading activities at former Building 771, was excavated and flows from the incoming pipes were intercepted, analyzed, and treated as needed. Pipes to and from the manway were either removed or disrupted and grouted. The manway was removed. Subsequently, the water in Pond A-4 was treated using a co-precipitation and filtration process and met stream standards for discharge. The Pond A-4 treatment system was removed in June, 2005.

Historically, the primary concern with contamination in the A-Series Drainage was high concentrations of nitrates in groundwater originating from the SEP area that impacted surface water. In response, a series of trenches were constructed to collect contaminated groundwater and seepage was constructed between the SEP (PAC 000-101) and the A-Series Drainage. This was followed by installation of the Interceptor Trench System (ITS), then by installation of the SEP Plume Treatment System. Other response actions included the removal of contaminated soil and sediment near the Building 771 outfall (PAC 700-143) (DOE 2004a), removal of contaminated sediments in and around Bowman's Pond (PAC 700-1108) (DOE 2005a), and rerouting of waste water discharges (DOE 1997).

IHSS Investigations

IHSSs 142.1 – 142.4 were initially investigated under the Phase I RFI/RI Work Plan for Walnut Creek Drainage, OU 6 (DOE 1992b). Recent characterization data were collected in accordance with the IABZSAP (DOE 2004b), and the Comprehensive Risk Assessment (CRA) SAP Addendum 05-01 – Phase 2 Targeted Sampling (DOE 2004c) and IABZSAP Addendum #

IABZ-05-06 (DOE 2005b). Samples collected in accordance with CRA SAP Addendum 05-01 were intended to collect the full sediment column. Sampling locations, in accordance with the IABZSAP Addendum #IABZ-05-06, were selected to target inlets, outlets, and the deepest part of the pond. Actual sampling locations were determined based on the consultative process taking into account pond topography and field conditions.

IHSS 142.1 – Pond A-1

In accordance with OU 6 Phase I RFI/RI Work Plan (DOE 1992b), four sediment samples were collected from Pond A-1 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Four additional surface sediment samples were collected 2 years later and analyzed for PCBs. All analytes had concentrations or activities less than RFCA WRW soil ALs (DOE et al. 2003).

Surface and subsurface sediment and subsurface soil samples were collected from two sampling locations at Pond A-1 in accordance with CRA SAP Addendum 05-01 (DOE 2004c). All samples were analyzed for radionuclides, metals, PCBs, SVOCs, VOCs, and dioxin/furan. The surface sediment from one location was lost because of the liquidity of the sediment. Samples were collected from four additional locations in accordance with IABZSAP Addendum #IABZ-05-06 (DOE 2005b). At Pond A-1, 2 surface sediment and 2 surface and subsurface sediment samples were collected and analyzed for radionuclides, metals, PCBs, and SVOCs. Results indicated all concentrations and activities were less than RFCA WRW soil ALs.

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d). Aroclor-1254 was detected at concentrations ranging from 1,331 to 5,200 µg/kg in subsurface sediment, but was not detected in surface sediment or subsurface soil. Americium-241 was detected at activities ranging from 2.0 to 6.9 pCi/g in surface sediments, and 0.1 to 13.2 pCi/g in subsurface sediments. Americium-241 was not detected in subsurface soil. Plutonium-239/240 was detected at activities ranging from 5.882 to 22.4 pCi/g in surface sediment, 23.3 to 36.2 in subsurface sediment and was not detected in subsurface soil. Aroclor-1254, americium-241, and plutonium-239/240 were detected at concentrations or activities less than RFCA WRW soil ALs. Dioxins and furans were detected in subsurface sediment at concentrations on slightly greater than the reporting limit. SVOCs were detected at concentrations greater than RLs but much less than WRW soil ALs in surface and subsurface sediment.

The ecological screen indicated aluminum, selenium, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, and Aroclor-1254 required evaluation. Surface sediment ecological screening level (ESL) hazard quotients (HQs) for these analytes were less than 10. Additionally, selenium concentrations were within background range. Previous studies have shown that aquatic life within Pond A-1 is typical of pond systems within the region and there has not been a measurable impact on Pond A-1 aquatic ecology attributable to these analytes. The results of the ecological screen indicated these analytes have a low risk to aquatic populations in Pond A-1.

IHSS 142.2 – Pond A-2

Three sediment samples were collected from Pond A-2 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs in accordance with the Phase I RFI/RI Work Plan (DOE 1992b). Three additional surface sediment

samples were collected 2 years later and analyzed for PCBs. All analytes had concentrations or activities less than RFCA WRW soil ALs.

Surface and subsurface sediment and subsurface soil samples were collected from one sampling location at Pond A-2 in accordance with CRA SAP Addendum 05-01. All samples were analyzed for radionuclides, metals, PCBs, SVOCs, VOCs, and dioxin/furan. Additionally, three surface and one subsurface sample were collected in accordance with IABZSAP Addendum #IABZ-05-06 and analyzed for radionuclides, metals, PCBs, and SVOCs. Results indicated all concentrations and activities were less than RFCA WRW soil ALs.

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d). Aroclor-1254 was detected at concentrations ranging from 35.0 to 36.0 µg/kg in subsurface sediment but was not detected in surface sediment or subsurface soil. Americium-241 was detected at activities ranging from 1.4 to 2.0 pCi/g in surface sediment, 2.1 to 3.5 pCi/g in subsurface sediment, and at 1.4 pCi/g in subsurface soil. Plutonium-239/240 was detected at activities from 4.3 to 7.4 pCi/g in surface sediment, 5.2 to 10.5 pCi/g in subsurface sediment, and at 2.6 pCi/g in subsurface soil. Aroclor-1254, americium-241, and plutonium-239/240 were detected at concentrations or activities less than RFCA WRW soil ALs. Only a few dioxins or furans were detected in surface and subsurface sediment and only one was detected in subsurface soil. SVOCs were detected at concentrations greater than RLs but much less than WRW soil ALs in surface and subsurface sediment.

The ecological screen indicated aluminum, manganese, acenaphthene, anthracene, indeno(1,2,3-cd)pyrene, Aroclor-1254, and total PCBs required additional evaluation. Surface sediment ESL HQs for aluminum, manganese, anthracene, and total PCBs were less than 10. Acenaphthene had an HQ of 27, however, it was detected in only 1 of 10 samples. Similarly, indeno(1,2,3-cd)pyrene had an HQ of 12, but it also was only detected in 1 of 10 samples. Manganese concentrations were within background range. Previous studies indicated the aquatic life within Pond A-2 is typical of pond systems within the region and there has not been a measurable impact on Pond A-2 aquatic ecology attributable to metal or chemical stressors. The results of the Ecological Screen indicated these analytes have a low risk to aquatic populations in Pond A-2.

IHSS 142.3 – Pond A-3

Four sediment samples were collected from Pond A-3 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs in accordance with the Phase I RFI/RI Work Plan (DOE 1992b). Four additional surface sediment samples were collected 2 years later and analyzed for PCBs. All analytes had concentrations or activities less than RFCA WRW soil ALs.

Surface sediment samples were collected from four locations at Pond A-3 in accordance with IABZSAP Addendum #IABZ-05-06. Samples were analyzed for radionuclides and metals. Results indicated all concentrations and activities were less than RFCA WRW soil ALs.

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d). PCBs were not detected in surface or subsurface sediment at Pond A-3. Americium-241 was detected at activities ranging from 0.42 to 0.47 pCi/g in surface sediment and from 0.47 to 0.67 pCi/g in subsurface sediment. Plutonium-239/240 was detected

at 2.05 pCi/g in subsurface sediment but was not detected in surface sediment. Americium-241 and plutonium-239/240 were detected at activities less than RFCA WRW soil ALs.

The ecological screen indicated aluminum, antimony, selenium, zinc, pyrene, and total PCBs required further evaluation. Surface sediment ESL HQs for these analytes were all less than 10. Aroclor-1254 was the only PCB congener detected with a frequency of one of eight samples collected. Zinc concentrations were within background range. Previous studies indicated aquatic life within Pond A-3 is typical of pond systems within the region and there has not been a measurable impact on Pond A-3 aquatic ecology attributable to these analytes. The results of the Ecological Screen indicated these analytes have a low risk to aquatic populations in Pond A-3.

IHSS 142.4 – Pond A-4

Four sediment samples were collected from Pond A-4, in accordance with the Phase I RFI/RI Work Plan (DOE 1992b), from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Four additional surface sediment samples were collected 2 years later and analyzed for PCBs. All analytes had concentrations or activities less than RFCA WRW soil ALs.

Five surface and three subsurface sediment samples were collected from at Pond A-4 in accordance with IABZSAP Addendum #IABZ-05-06. Samples were analyzed for radionuclides and metals. Results indicated all concentrations and activities were less than RFCA WRW soil ALs.

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d). Neither PCBs, americium-241, nor plutonium-239/240 were detected in any samples from Pond A-4. Several metals were detected but only at concentrations only slightly greater than background means plus two standard deviations. Bis(2-ethylhexyl)phthalate was the only SVOC detected at concentrations only slightly greater than RLs.

The ecological screen indicated aluminum, antimony, cadmium, and selenium required additional evaluation. Surface sediment ESL HQs for aluminum, cadmium, and selenium were less than 10. Antimony had an HQ of 21; however, it was detected in only 4 of 12 samples and occurred within background range. Previous studies indicated aquatic life within Pond A-4 is typical of pond systems within the region and there has never been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-4. The results of the Ecological Screen indicated these analytes have a low risk to aquatic populations in Pond A-4.

No Further Accelerated Action Recommendation

Based on analytical results, the SSRS, and the ecological screen, accelerated action is not required and an NFAA determination is justified for IHSSs 141.1, 141.2, 141.3, and 141.41 for the following reasons:

- Activities and concentrations of COCs were uniformly below RFCA WRW soil ALs.
- Migration of soil or sediment contaminants to surface water is unlikely to impact water quality because little contamination is present. Routine surface water monitoring results indicate surface water standards are met and that pond sediments are not impacting surface

water. The ponds are also configured to protect off-site water sources. Stormwater runoff is retained in Terminal Pond A-4, sampled, and if the surface water results meet applicable standards, the water is released. Erosion of the pond sediments because of a large influx of water (from a storm) is not likely because the ponds are currently and expected to remain as low-energy ponds and less water will be available after Site closure. Additionally, predictions of contaminant migration based on the integration of the Watershed Erosion Prediction Project (WEPP) (USDA 1995) and HEC-6T (Thomas 1999) models are conservative. Site empirical data indicate contaminant migration is less than model predictions.

- Contaminants originating in IHSSs 141.1, 141.2, 141.3, and 141.4 soil and sediment are not likely to impact surface water via transport in groundwater because soil contamination levels in these IHSSs are very low. Groundwater was evaluated as part of the Groundwater Interim Measure/Interim Remedial Action (IM/IRA) (DOE 2005c).
- Based on the ecological screen for the ponds, removal of sediment to protect ecological receptors is not necessary.

The NFAA recommendation for Ponds A-1 (IHSS 142.1), A-2 (IHSS 142.2), A-3 (IHSS 142.3), and A-4 (IHSS 142.4), presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d), was approved by EPA (the LRA) on ____.

Comments

In the 1997 HRR (DOE 1997), IHSS 142.4 (Pond A-4) was recommended for NFA based on conclusions presented the Phase I RFI/RI Report for OU 6 (DOE 1996). The NFA request was denied (CDPHE and EPA 1999).

References

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PAC REFERENCE NUMBERS: NE-142.5 – 142.9

IHSS Number: 142.5 – 142.9
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: NE-1
Unit Name: Walnut Creek Drainage

This Final Update to the HRR for PACs NE-142.5 through NE-142.6 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs NE-142.5 – NE-142.9 is summarized in this update. The following HRR volumes contain NE-142.5 – NE-142.9 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1997 Annual (DOE 1997).

Date(s) of Operation or Occurrence

Before July 1953 through Present

Historical Summary

The B-Series Ponds are located in the South Walnut Creek drainage, downstream of the 900 Area, and include Pond B-1 (IHSS NE-142.5), Pond B-2 (IHSS NE-142.6), Pond B-3 (IHSS NE-142.7), Pond B-4 (IHSS NE-142.8), and Pond B-5 (IHSS NE-142.9). The location of these IHSSs is shown on Figures 8 and 9. The B-Series Ponds were designed and constructed to collect surface runoff and allow for management and controlled off-site discharge of water. The ponds served three main purposes: stormwater management, holding water for sampling and treatment (if necessary) and emergency spill control if a spill could not be adequately managed without use of the ponds. However, because the site is no longer in operation, the ponds are no longer used for emergency spill control.

In the B-Series Ponds, Ponds B-1 and B-2, are nondischarge ponds and water from them was seldom released. Flow in South Walnut Creek is diverted around the first three ponds directly to Pond B-4, which flows to Pond B-5, the Terminal Pond in the B-Series. Pond B-3 discharges to Pond B-4, which formerly received discharge from the Rocky Flats wastewater treatment plant. Water from Pond B-5 was previously pumped to Pond A-4, where all the water was sampled and held until the results confirmed compliance with applicable stream standards. In 1998, direct discharge of Pond B-5 was allowed under an agreement reached with the neighboring cities and other stakeholders. Currently, Ponds B-1, B-2 and B-3 are not configured to receive water except for local area runoff or to discharge. These ponds were converted to wetlands after the accelerated action sediment removal activities that concluded in 2005 (see discussion below). Ponds B-1, B-2, and B-3 are now a flow through system. Pond B-4 is still connected to the bypass and South Walnut Creek flows continue to go through Ponds B-4 and B-5.

A sediment study conducted by Colorado State University (CSU) found elevated radionuclide activities in sediments in the B-Series Drainage (the B-Series Ponds in the Walnut Creek

Drainage). Pond reconstruction activities from 1971 to 1973 caused resuspension and downstream migration of contaminated sediment. This resulted in an increase in plutonium-239/240 activity in Pond B-1 sediment from 0.085 curie in 1971 to 2.9 curies in 1973. Based on the CSU sampling, plutonium-239/240 activities in Pond B-1 sediment in June 1973 ranged from 10 to 502 pCi/g of dry sediment.

A Rocky Flats study completed in June 1973 indicated elevated plutonium-239/240 activity in sediments upstream from the drainage ponds. This study found an average activity of 40 disintegrations per gram (dpm/g) from the culvert west of the Building 995 to the culvert immediately east of the Building 995 outfall. The area of contaminated soil/sediment was estimated to cover approximately 3,900 ft².

In response, a study was conducted to ascertain the source of the plutonium-239/240 contamination present in the B-Series Drainage. This study indicated approximately 88 percent of the total activity released by Building 995 was due to the release of laundry decontamination water to the sanitary sewer. After December 21, 1973, laundry water was only discharged to Pond B-2, and some may have been diverted to Pond A-2. In fall and winter 1973, contaminated soil and sediment were removed from the streambed below the Building 995 outfall.

Both footing drains and storm drains have discharged into the B-Series Drainage. Releases to the B-Series Drainage included treated and untreated decontamination laundry water from Buildings 442, 771, 774, 778, and 881 to Pond B-1; a sodium hydroxide discharge from a bulk caustic storage tank that was diverted to Pond B-1 for temporary holding; a steam condensate line break in the Building 707 area that discharged to Pond B-4 and South Walnut Creek downgradient of Pond B-4; release of approximately 155 gallons of a 25 percent solution of ethylene glycol (antifreeze); and a release of chromic acid to Pond B-3 from the Sewage Treatment Plant (Building 995) that occurred on February 22 and 23, 1989. It is believed that approximately 4.7 pounds of chromium were released to Pond B-3. Prior to this incident, the water from Pond B-3 was then sprayed on the East Spray Fields (PACs NE-216.1 - 216.3). Samples collected from the pond sediment and the East Spray Fields at that time found that concentrations of leachable chromium were far below the RCRA Extraction Procedure (EP) Toxicity limits.

The National Pollution Discharge Elimination System (NPDES) Permit system was initiated in 1974 at the Plant. The HRRs (DOE 1992a, 1997) detail the NPDES permit exceedances for the B-Series Drainage at the Plant.

In the early 1980s actions were taken at Pond B-5 to reduce the potential for off-site movement of contaminated sediments. The discharge structure for this pond was modified by adding a vertical standpipe and a perforated pipe along the bottom of the pond surrounded by granular material. Some sediment present in Pond B-5 was also removed from the drainage and deposited in the Soil Dump Area in the northeastern BZ (PAC NE-156.2 which received NFAA approval in 1999 [CDPHE and EPA 1999]). These activities helped minimize the off-site transport of contaminated sediments (DOE 1992a).

In response to leaching of contaminants out of pondcrete, which led to the presence of contaminants in the B-Series Drainage, two RCRA Contingency Plan Implementation Reports (CPIRs), 88-001 and 88-002, were filed. These events are more fully discussed in PAC 900-213 (DOE 1992a).

IHSS Investigations

IHSSs 142.5 – 142.9 were initially investigated under the OU 6 Phase I RCRA RFI/RI Work Plan for Walnut Creek Drainage, OU 6 (DOE 1992b). Recent characterization data were collected in accordance with IABZSAP Addendum #IABZ-05-06 (DOE 2005a) at Ponds B-4 and B-5. Sampling locations were selected to target inlets, outlets, and the deepest part of the pond. Actual sampling locations were determined based on the consultative process taking into account pond topography and field conditions. Additionally, a RFCA accelerated action was conducted at Ponds B-1, B-2, and B-3. Each pond is briefly described below.

IHSS 142.5 – Pond B-1

In accordance with Phase I RFI/RI Work Plan (DOE 1992b), six surface and nine subsurface sediment samples were collected from Pond B-1 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Aroclor-1254, ranged from nondetect to 1,700 µg/kg in surface sediment and 140 to 310 µg/kg in subsurface sediment. Americium-241 ranged from 0.6 to 72 pCi/g in surface sediment and 5.5 to 194.5 pCi/g in subsurface sediment. Plutonium-239/240 ranged from 28.19 to 440 pCi/g in surface sediment and from 31.4 to 87.38 pCi/g in subsurface sediment. Both americium-241 and plutonium-239/240 activities were greater than WRW soil ALs (DOE et al. 2003). SVOCs were detected at concentrations greater than RLs but less than WRW soil ALs in surface and subsurface sediment.

Based on these data, ER RSOP FY04 Notification #04-11 (DOE 2004a) was prepared to describe RFCA (DOE et al. 1996) planned accelerated actions at the B-1, B-2, and B-3 Ponds. Prior to accelerated actions, two additional samples were collected outside of Pond B-1 and analyzed for radionuclides to better define the areal extent of contamination. Neither americium-241 nor plutonium-239/240 were detected in these samples.

Approximately 7,600 cy of sediment and soil, over an 113,900 ft² area, was removed from Pond B-1 and the upgradient drainage leading into the pond, and disposed off site. The deepest point of the excavation was 19.4 ft below the original sediment surface. Fifty-two confirmation samples were collected in Pond B-1 and the drainage upstream of Pond B-1. After remediation, all results were less than RFCA WRW soil ALs. Americium-241 ranged from 0.14 to 8.4 pCi/g and plutonium-239/240 ranged from 0.052 to 36.3 pCi/g in subsurface soil. Aroclor-1254 was detected at two locations at a concentration of 9.2 and 80 µg/kg.

IHSS 142.6 – Pond B-2

In accordance with Phase I RFI/RI Work Plan (DOE 1992b), 6 surface and 9 subsurface sediment samples were collected from Pond B-2 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Aroclor-1254 ranged from nondetected to 3,800 µg/kg in surface sediment and nondetected to 666 µg/kg in subsurface sediment. Americium-241 ranged from 4.9 to 160 pCi/g in surface sediment and 8.7 to 27.1 pCi/g in subsurface sediment. Plutonium-239/240 ranged from 13.10 to 939.43 pCi/g in surface sediment and from 36.9 to 154.58 pCi/g in subsurface sediment. Both americium-241 and plutonium-239/240 were detected at activities greater than WRW soil ALs at a sampling location near the former OPWL discharge point into Pond B-2. OPWL had previously been removed from this area (DOE 2005b,c). SVOCs were detected at concentrations greater than RLs but less than WRW soil ALs in surface and subsurface sediment.

Based on these data, ER RSOP #04-11 (DOE 2004a) was prepared to describe RFCA (DOE et al. 1996) planned accelerated actions at the B-1, B-2, and B-3 Ponds. Prior to accelerated actions, two additional samples were collected outside of Pond B-2 and analyzed for radionuclides to better define the areal extent of contamination. Neither americium-241 nor plutonium-239/240 were detected in these samples.

Approximately 20,900 cy of sediment and soil, over an 52,100 ft² area, was removed from Pond B-2 and disposed off site. The deepest point of the excavation was 18.3 ft below the original sediment surface. Fifty-three confirmation samples were collected in Pond B-2. After remediation, all results were less than RFCA WRW soil ALs. Americium-241 ranged from 0.18 to 8.53 pCi/g and plutonium-239/240 ranged from 0.323 to 48.62 pCi/g in subsurface soil. Aroclor-1254 was detected at two locations at concentrations of 320 and 360 µg/kg.

IHSS 142.7 – Pond B-3

In accordance with Phase I RFI/RI Work Plan (DOE 1992b), three surface and nine subsurface sediment samples were collected from Pond B-3 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Aroclor-1254 ranged from nondetected to 1,300 µg/kg in surface sediment and nondetected to 2,900 µg/kg in subsurface sediment. Americium-241 ranged from 0.395 to 63.07 pCi/g in surface sediment and 0.673 to 63.07 pCi/g in subsurface sediment. Plutonium-239/240 was not detected in surface sediment, but ranged from 7.57 to 188.2 pCi/g in subsurface sediment. Plutonium-239/240 was detected at activities greater than WRW soil ALs. SVOCs were detected at concentrations greater than RLs but less than WRW soil ALs in surface and subsurface sediment.

Based on these data, ER RSOP #04-11 (DOE 2004a) was prepared to describe RFCA (DOE et al. 1996) planned accelerated actions at the B-1, B-2, and B-3 Ponds. Approximately 12,000 cy of sediment and soil, over a 26,700 ft² area, was removed from Pond B-3 and disposed off site. The deepest point of the excavation was 14.6 ft below the original sediment surface. Thirty-one confirmation samples were collected in Pond B-3. After remediation, all results were less than RFCA WRW soil ALs. Americium-241 ranged from 0.13 to 4.28 pCi/g, where detected, and plutonium-239/240 ranged from 0.215 to 9.70 pCi/g, where detected in subsurface soil. Aroclor-1254 was detected at two locations at concentrations of 68 and 220 µg/kg.

IHSS 142.8 – Pond B-4

In accordance with OU 6 Phase I RFI/RI Work Plan (DOE 1992b), nine sediment samples were collected from Pond B-4 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Five additional surface sediment samples were collected 2 years later and analyzed for PCBs. All analytes had concentrations or activities less than RFCA WRW soil ALs.

Surface and subsurface sediment and subsurface soil samples were collected from six sampling locations at Pond B-4 in accordance with IABZSAP Addendum #IABZ-05-06 (DOE 2005a). At Pond B-4, 5 surface sediment and 7 subsurface sediment samples were collected and analyzed for radionuclides, metals, PCBs, and SVOCs.

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d). Aroclor-1254 was detected at a concentration of 160 µg/kg at one location in surface sediment and ranged from 9.21 to 3,100 in subsurface sediment. Americium-241 was detected at activities ranging from 0.598 to 0.76 pCi/g in surface sediments,

and 8.27 to 56.50 pCi/g in subsurface sediments. Plutonium-239/240 was detected once in surface soil at an activity of 2.06 pCi/g. In subsurface sediment, plutonium-239/240 ranged from 40.10 to 217.00 pCi/g in subsurface sediment where detected. The plutonium-239/240 activity of 217.00 pCi/g is at a depth of 3.0 to 3.9 ft below the sediment surface. Aroclor-1254, americium-241, and plutonium-239/240 were detected at concentrations or activities less than WRW soil ALs. SVOCs were detected at concentrations greater than RLs but much less than WRW soil ALs in surface and subsurface sediment.

The ecological screen indicated aluminum, cadmium, selenium, silver, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, Aroclor-1254, total PAHs, and total PCBs required further evaluation. Surface sediment ESL HQs for these analytes, with the exceptions of benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene, were less than 10. Benzo(g,h,i)perylene had an HQ of 21; however, it was detected in only 10 of 22 samples. Similarly, indeno(1,2,3-cd)pyrene had an HQ of 12, but it was detected in only 10 of 22 samples. Zinc concentrations were within background ranges. The results of the ecological screen indicated these analytes have a low risk to aquatic populations in Pond B-4.

IHSS 142.9 – Pond B-5

In accordance with OU 6 Phase I RFI/RI Work Plan (DOE 1992b), seven sediment samples were collected from Pond B-5 from the top of the sediment to top of bedrock and analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Three additional surface sediment samples were collected 2 years later and analyzed for PCBs. All analytes had concentrations or activities less than RFCA WRW soil ALs.

Surface and subsurface sediment and subsurface soil samples were collected from five sampling locations at Pond B-5 in accordance with IABZSAP Addendum #IABZ-05-06 (DOE 2005a). Five surface sediment and two subsurface sediment samples were collected and analyzed for radionuclides and metals. All analytes had concentrations or activities less than RFCA WRW soil ALs.

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d). Aroclor-1254 was not detected. Americium-241 was detected at activities ranging from 0.321 to 0.337 pCi/g in surface sediments, and was not detected in subsurface sediment. Plutonium-239/240 was not detected in surface or subsurface sediment.

The ecological screen indicated aluminum, selenium, and zinc required additional evaluation. Surface sediment ESL HQs for these metals were less than 10. Previous studies indicated aquatic life within Pond B-5 is typical of pond systems within the region and there has not been a measurable impact on Pond B-5 aquatic ecology attributable to a chemical stressor. There has never been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond B-5. The results of the ecological screen indicated these analytes have a low risk to aquatic populations in Pond B-5.

No Further Accelerated Action Recommendation

Based on analytical results, the SSRS, and the ecological screen, accelerated action is not required and an NFAA determination is justified for IHSSs 142.5, 142.6, 142.7, 142.8, and because of the following:

- Contaminated sediment was removed from Ponds B-1, B-2, and B-3. Confirmation sampling indicated all residual concentrations and activities were less than WRW soil ALs.
- Activities and concentrations of COCs at Ponds B-4 and B-5 were uniformly below RFCA WRW soil ALs with the exception of the detection of plutonium-239/240 in a one subsurface sediment sample collected at Pond B-4 at a depth of 3.0 to 3.9 ft. In accordance with RFCA sediment removal not required for radionuclide contamination less than 1 nCi/g at depths greater than 3 ft.
- Migration of soil or sediment contaminants to surface water is unlikely to impact water quality because little contamination is present. Routine surface water monitoring results indicate surface water standards are met and that pond sediments are not impacting surface water. The ponds are also configured to protect off-site water sources. Stormwater runoff is retained in the Terminal Ponds, sampled, and if the surface water results meet applicable standards, the water is released. Erosion of the pond sediments because of a large influx of water (from a storm) is not likely because the ponds are currently and expected to remain as low-energy ponds and less water will be available after Site closure. Additionally, predictions of contaminant migration based on the integration of the WEPP (USDA 1995) and HEC-6T (Thomas 1999) models are conservative. Site empirical data indicate contaminant migration is less than model predictions.
- Contaminants originating in IHSSs 141.5, 141.6, 141.7, 141.8, and 141.9 soil and sediment are not likely to impact surface water via transport in groundwater because soil contamination levels in these IHSSs are very low. Groundwater contamination present beneath the B-Series Ponds was evaluated as part of the Groundwater IM/IRA (DOE 2005e).
- Based on the ecological screen for the Ponds B-4 and B-5 removal of sediment to protect ecological receptors is not necessary.

The NFAA recommendation for Ponds B-1 (IHSS 142.5), B-2 (IHSS 142.6), and B-3 (IHSS 142.7) presented in the Closeout Report for IHSS Group NE-1 (DOE 2005b) was approved by EPA May 12, 2005 (EPA 2005).

The NFAA recommendation for Ponds B-4 (IHSS 142.8) and B-5 (IHSS 142.9) presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005d) was approved by EPA (the LRA) on _____.

Comments

None

References

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PAC REFERENCE NUMBER: NE-142.12

IHSS Number: 142.12
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: NE-1
Unit Name: Flume Pond (Walnut Creek Gauging Station)(IAG Name-
Retention Pond A-5; RFI/RI Name – Walnut and Indiana Pond)

This Final Update to the HRR for PAC NE-142.12 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 142.12 is summarized in this update. The following HRR volumes contain IHSS 142.12 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1996 Annual (DOE 1996a).

Date(s) of Operation or Occurrence

Fall 1978 to present

Historical Summary

IHSS 141.12 (Pond A-5), the flume pond is located on the Walnut Creek drainage immediately west of and upstream from Indiana Street. The location of Pond A-5 is shown on Figures 8 and 9. The flume pond was built in 1978. The Walnut Creek Drainage has received discharges from Rocky Flats throughout the history of the Plant.

Pond A-5 is a flow-through pond that generally retains several thousand gallons of water. Pond A-5 cannot be used to retain a storm surge and regulate discharge. This pond is cleaned out occasionally to reduce buildup of sediment on the bottom or to reconstruct the flumes. The removed sediment was placed on the southern side of Walnut Creek upstream of the pond and within the IHSS boundary. A primary source of these sediments is the McKay Ditch Bypass, which was originally constructed as an unlined ditch, and therefore carried considerable amounts of entrained sediments (DOE 1992a).

IHSS Investigations

In accordance with Phase I RFI/RI Work Plan (DOE 1992b), sediment samples were collected at five different locations within Pond A-5. One sample was collected within 5 ft of the pond inlet, one from the deepest part of the pond, and the remaining three samples were collected at random locations. Composite samples were collected from 2-ft intervals. Sediment samples were analyzed for radionuclides, VOCs, SVOCs, pesticides, PCBs, and metals. Eight soil samples were collected from the soil outside of the pond. Two of these samples were analyzed for radionuclides, metals, and VOCs and five were analyzed for metals and VOCs.

Recently, additional surface and subsurface sediment and subsurface soil samples were collected from three sampling locations at Pond A-5 in accordance with IABZSAP Addendum #IABZ-05-06 (DOE 2005a). At Pond A-5, 2 surface sediment and 1 surface and subsurface

sediment samples were collected and analyzed for radionuclides and metals. Results indicated all concentrations and activities were less than RFCA WRW soil ALs (DOE et al. 2003).

Based on analytical data from both sampling events, several metals were detected in surface and subsurface sediment at concentrations only slightly greater than background mean plus two standard deviations. All were well below WRW soil ALs. Neither americium-241 nor plutonium-239/240 were detected in surface or subsurface sediment. Americium-241 was detected once, at an activity of 0.122 pCi/g in soil and plutonium-239/240 was detected twice in surface soil at activities of 0.262 and 0.285 pCi/g.

Five surface water samples were collected from the pond: one from the deepest part, one within 5 ft of the inlet, one within 5 ft of the spillway, and two were randomly collected. Surface water samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals (total and dissolved), radionuclides (total and dissolved), and water quality parameters. Two stream sediment samples were also collected: one sample was collected from McKay Ditch, just upstream from its confluence with Walnut Creek, and another was collected from Walnut Creek, just downstream from the pond spillway. These stream sediment samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, radionuclides, and water quality parameters. Sodium was the only analyte detected at a range of concentrations from 23.6 mg/L to 26.7 mg/L in surface water.

Groundwater samples were collected from two downgradient alluvial monitoring wells (0486 and 41691) and analyzed for radionuclides, metals, VOCs, SVOC, pesticides/PCBs and nitrate/nitrite. Analytical results indicate methylene chloride at 10 µg/L and toluene at 0.12 µg/L, bis(2-ethylhexyl)phthalate at 3.0 µg/L, plutonium-239/240 (dissolved) at 0.0035 pCi/L, chromium (dissolved) at 16.8 µg/L, zinc at 314 µg/L, manganese at 1,010 µg/L, and potassium at 5720 µg/L were detected in groundwater. Pesticides/PCBs were not detected and nitrates/nitrites were not found at concentrations greater than baseline screening values.

A CDPHE risk-based conservative screen (CDPHE 1993) was conducted on surface water, pond sediment, and stream sediment for IHSS 142.12 (DOE 1994). Passing the conservative screen requires a carcinogenic and noncarcinogenic risk ratio sum of below 1. The carcinogenic ratio sum for Pond A-5 sediment is 2.84×10^{-3} and the noncarcinogenic ratio sum is 3.34×10^{-5} . Both of these values are below 1. These ratios differ somewhat from those presented in the OU 6 Letter Report (DOE 1994) because methylene chloride was subsequently determined to be a laboratory contaminant and was omitted from the data set (DOE 1995b). Results of the screen on stream sediment samples show a carcinogenic risk ratio sum of 3.73×10^{-3} and a noncarcinogenic risk ratio sum of 3.36×10^{-5} ; both sums are below 1. Additionally, the carcinogenic and noncarcinogenic risk ratio sums for dermal exposure for both pond and stream sediment are below 1 and the risk to human health from exposure to pond and stream sediment at IHSS 142.12 is very low based residential scenario. Potential ecological threats from exposure to sediment constituents at IHSS 142.12 were also evaluated. There is little risk to the environment based on chemical concentrations detected in this IHSS (DOE 1995b).

Results of the Ecological Screen at Pond A-5 indicated all analytes have surface sediment maximum detected concentration (MDC) values less than the ESL. These analytes have a low risk to aquatic populations in Pond A-5 (DOE 2005c).

No Further Action Recommendation

Based on analytical results, the SSRS, and the ecological screen, accelerated action is not required and an NFAA determination is justified for IHSS 142.12 because of the following:

- Activities and concentrations of COCs were uniformly below RFCA WRW soil ALs at Pond A-5.
- Migration of soil or sediment contaminants to surface water is unlikely to impact water quality because little contamination is present. Routine surface water monitoring results indicate surface water standards are met and that pond sediments are not impacting surface water. The upstream ponds are also configured to protect off-site water sources. Stormwater runoff is retained in the Terminal Ponds, sampled, and if the surface water results meet applicable standards, the water is released. Erosion of the pond sediments because of a large influx of water (from a storm) is not likely because the ponds are currently and expected to remain as low-energy ponds and less water will be available after Site closure. Additionally, predictions of contaminant migration based on the integration of the WEPP (USDA 1995) and HEC-6T (Thomas 1999) models are conservative. Site empirical data indicate contaminant migration is less than model predictions.
- Contaminants originating in IHSS 142.12 soil and sediment are not likely to impact surface water via transport in groundwater because soil contamination levels in IHSS 142.12 are very low. Groundwater was evaluated as part of the Groundwater IM/IRA (DOE 2005b).
- Based on the ecological screen for Pond A-5, removal of sediment to protect ecological receptors is not necessary.

The NFAA recommendation for Pond A-5 (IHSS 142.12) presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005c) was approved by EPA on ____.

Comments

None

References

CDPHE, 1993, Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities, November.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan Walnut Creek Priority Drainage (Operable Unit NO. 6) Rocky Flats Plant, Golden, Colorado, May.

DOE, 1994, Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk-based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment, Walnut Creek Priority Drainage, Operable Unit No. 6, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995a, Human Health Risk Assessment Methodology for Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 1995a, Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6 (Draft), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1995b, Programmatic Risk-Based Preliminary Remediation Goals, Final Revision 3, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1996a, Historical Release Report 1996 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Industrial Area and Buffer Zone Sampling and Analysis Plan Addendum #IABZ-05-06, Rocky Flats Environmental Technology Site Golden, Colorado, July.

DOE, 2005b, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site Golden, Colorado, June

DOE, 2005c, Data Summary Report for IHSS Group NE-1, Rocky Flats Environmental Technology Site Golden, Colorado, (in prep)

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA (approval letter)

Thomas, W.A., 1999, Sedimentation in Stream Networks (HEC-6T). Mobile Boundary Hydraulics, Clinton, Mississippi.

USDA, 1995, Water Erosion Prediction Project Hillslope Profile and Watershed Model Documentation, NERSL Report No. 10. D.C. Flanigan, M.A. Nearing, and J.M. Laflin, eds, USDA-ARS National Soil Erosion Research Laboratory, West Lafayette, Indiana.

PAC REFERENCE NUMBER: NE-156.2

IHSS Number: 156.2
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: Not Applicable
Unit Name: Soil Dump Area between the A-Series and B-Series Drainages

This Final Update to the HRR for PAC NE-156.2 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 156.2 is summarized in this update. The following HRR volumes contain IHSS 156.2 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1968 to 1973

Historical Summary

IHSS 156.2 is located in an area immediately north of Pond B-1 (PAC NE-142.5) and between the A-Series Drainage and B-Series Drainage was used for the dumping of soil. The location of IHSS 156.2 is shown on Figures 8 and 9. The possible sources of the soil disposed of in this area were:

- Soil excavated for building construction projects may have been placed in this area in the late 1960s.
- Sediments removed from the Pond B-5 (PAC NE-142.9) discharge outlet modification activities may also have been placed in this general area.
- The RCRA 3004(u) Report (DOE 1987) identified this area as a soil disposal location from construction activities at Building 774. However, this is unlikely as Building 774 was constructed before 1968.

No documentation was found that contained analyses of the soil from construction projects or from the Pond B-5 modification work (DOE 1992).

IHSS Investigations

OU 6 RFI/RI Activities

In accordance with the Phase I RFI/RI Work Plan (DOE 1991) for OU 6, activities at IHSS 156.2 included the collection of surface soil and subsurface soil samples from 22 gridded locations. These results are described in the RFI/RI Report (DOE 1996a). The COCs for soil were metals, radionuclides, and VOCs. Surface soil samples were collected in the uppermost 2 inches. Boreholes were drilled to a depth of 3 ft into undisturbed soil beneath any fill. Within the overlying fill material, composite samples were collected in 6-ft increments. Prior to the

collection of surface and subsurface soil samples, a 17-pt Field Instrument Detection of Low Energy Radiation (FIDLER) survey was conducted around each sampling location (DOE 1996a).

Eleven metals and two radionuclides were detected at concentrations above their respective background levels in one or more of the surface soil samples collected in IHSS 156.2. These were antimony (43.6 mg/kg), calcium, chromium, copper, iron, magnesium, mercury, nickel, strontium, vanadium, zinc, americium-241, and plutonium-239/240. Strontium was detected above background in 18 of the 22 samples. Americium-241 (maximum activity of 0.301 pCi/g) and plutonium-239/240 (maximum activity of 1.85 pCi/g) were detected above background in 13 of 21 and 8 of 21 samples, respectively. For both metal and radionuclides, concentrations exceeding background were randomly distributed throughout the IHSS (1996a).

Subsurface soil samples from IHSS 156.2 were analyzed for VOCs, metals, and radionuclides. Seven VOCs were detected in subsurface soil at IHSS 156.2, of which four (2-butanone, acetone, methylene chloride, and toluene) were suspected laboratory contaminants. The remaining VOC detections were of 4-methyl-2-pentanone, chlorobenzene, and total xylenes, which were each detected once at low concentrations (less than 5 µg/kg). Five metals and three radionuclides were detected in subsurface soil at concentration exceeding background, including barium, calcium, strontium, lead (maximum concentration of 84.9 mg/kg), zinc, americium-241, plutonium-239/240, and uranium 235. The maximum activities of americium-241, plutonium-239/240, and uranium-235 were 0.31 pCi/g, 0.88 pCi/g, and 0.16 pCi/g, respectively. Occurrences of all analytes present above background appeared to be random throughout the IHSS (1996a).

No Further Action Recommendation

As part of the OU 6 RFI/RI, a Human Health Risk Assessment (HHRA) evaluated risks for current and future receptors exposed to IHSS 156.2 and two adjacent IHSSs. The results showed that for all current and future on-site residential receptors the cumulative hazard indices (HIs) for noncarcinogenic health effects were 0.01 or less; therefore no adverse noncancer health effects were expected under the exposure conditions evaluated. The excess lifetime cancer risk was estimated at 4×10^{-7} , indicating negligible risk. Results of the Ecological Risk Assessment (ERA) for the Walnut Creek Watershed indicated no adverse ecological effects to ecological receptors (DOE 1996a).

IHSS 156.2 (PAC NE-156.2) was proposed for NFA in the 1997 HRR (DOE 1997), consistent with the criteria for recommending NFA decisions presented in RFCA (DOE 1996b). DOE received EPA (the LRA) and CDPHE approval of the NFA status of IHSS 156.2 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1987, Appendix 1, Resource Conservation and Recovery Act 3004 (u) Waste Management Units, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1991, Final Phase I RFI/RI Work Plan, Walnut Creek Priority Drainage(Operable Unit No. 6, Rocky Flats Plant, Golden, Colorado, September.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996a, Final Phase I RFI/RI Report Walnut Creek Priority Drainage, Operable Unit 6, RF/ER-95-0119.UN, Rev 0. Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1996b, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1997, Historical Release Report 1997 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Historical Release Report 1999 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBERS: NE-166.1, NE-166.2, AND NE-166.3

IHSS Numbers: 166.1, 166.2, and 166.3
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: Not Applicable
Unit Name: Trenches South of the Present Landfill (IHSS Name: Trenches A, B, and C; Trench C consists of two smaller trenches)

This Final Update to the HRR for PACs NE-166.1, NE-166.2, and NE-166.3 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 166.1, 166.2, and 166.3 is summarized in this update. The following HRR volumes contain information regarding IHSSs 166.1, 166.2, and 166.3:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

Prior to 1964 and also 1970

Historical Summary

Trenches A, B, and C (IHSSs 166.1, 166.2, and 166.3) were located north of the IA and immediately south of the Present Landfill (PAC NW-114). The location of these IHSSs is shown on Figures 8 and 9.

Conflicting information has been found regarding the description of Trenches A, B, and C (IHSSs 166.1, 166.2, and 166.3). Listed below are four explanations for the existence of those trenches.

- According to one reference, these trenches received a few hundred gallons of liquid from the Rocky Flats sanitary wastewater treatment plant (Building 995) in 1970 (DOE 1992). A map with that reference indicates only one trench in the area.
- The RCRA 3004(u) Report (DOE 1987) stated that sludge from Building 995 was disposed on in two trenches and possibly in a third trench near the landfill. This sludge was generated during a period of high sewage sludge output from Building 995, but no other time frame for these activities is given.
- One document included a brief discussion of possible sludge disposal “out north of the plant.” This document also discusses sanitary wastewater treatment plant sludge from the No. 1 digester at Building 995 being disposed by Austin (a construction firm) to the north of the plant (DOE 1992).
- Another reference stated that the sanitary sewage sludge that was disposed of in this area was simply pumped on the ground and the area was never actually trenched (DOE 1992).

Aerial photographs of Rocky Flats do not indicate any disturbances in the location of these trenches in 1955, but in a 1964 photo, disturbed areas corresponding to the locations of these three trenches are visible. The disturbed areas do not show significant change in any photographs taken after 1964.

Older sanitary wastewater treatment plant sludge (prior to 1957) would reportedly have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination beginning in 1957. Total long-lived alpha activity present in the sludge has been reported between a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960 (DOE 1992).

IHSS Investigations

OU 6 RFI/RI Activities

IHSSs 166.1, 166.2, and 166.3 were investigated as part of the OU 6 RFI/RI in accordance with the OU 6 Phase I RFI/RI Work Plan (DOE 1991). During the OU 6 field investigation (1992-1993) 26 soil borings were drilled to a depth of 5 ft below the bottom of the disturbed area of each trench. Eight borings were drilled in Trench A, seven in Trench B, six in Trench C west, and five in Trench C east. Soil samples were analyzed for VOCs, metals, and radionuclides (DOE 1996b).

VOCs detected in subsurface soil samples collected at Trenches A, B, and C include four compounds labeled as "suspect" (2-butanone, acetone, methylene chloride, toluene), and five additional compounds believed to be representative of actual environmental conditions (benzene, chloroform, trichloroethene, 4-methyl-2-pentanone, styrene). The highest VOC concentration was tetrachloroethene at 21 µg/kg. The suspect VOCs are likely laboratory contaminants (DOE 1996b).

Metals detected at concentrations slightly greater than background in subsurface soil in Trenches A, B, and C included chromium, barium, calcium, and strontium. Detections of calcium in excess of background concentrations were limited to depths less than 6 ft bgs in intervals where caliche was observed (DOE 1996b).

Radionuclides detected in excess of background activities included americium-241, plutonium-239/240, and uranium-235 with maximum activities of 0.0229 pCi/g, 0.0855 pCi/g, and 0.13 pCi/g, respectively. Activities of these were at or slightly above background levels in composite samples up to 6 ft bgs (DOE 1996b).

No Further Action Recommendation

IHSSs 166.1, 166.2, and 166.3 were proposed for NFA based on the results of HHRA and ERA, as presented in the 1996 HRR Annual Update (DOE 1996). Carcinogenic and noncarcinogenic ratio sums were 8.81×10^{-1} and 1.57×10^{-1} , respectively. The results of a dermal assessment indicated that risk to a resident from dermal exposure was also low, with risk ratio sums of 3.46×10^{-5} and 1.19×10^{-3} . The ERA for the Walnut and Woman Creek Watersheds (presented as an Appendix in the OU 5 RFI/RI Report) indicated no risk to the environment due to contamination detected in IHSSs 166.1, 166.2, and 166.3 (DOE 1996c).

Based on the above findings, NFA was proposed for IHSSs 166.1, 166.2, and 166.3, (Trenches A, B, and C) in the HRR 1996 Annual Update (DOE 1996a). DOE received approval of the

NFA status of IHSSs 166.1, 166.2, and 166.3 from EPA (the LRA) and CDPHE on February 14, 2002 (EPA and CDPHE 2002).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1987, Appendix 1, Resource Conservation and Recovery Act 3004 (u) Waste Management Units, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1991, Final Phase II RFI/RI Work Plan, Walnut Creek Priority Drainage, (Operable Unit No. 6), Rocky Flats Plant, Golden, Colorado, September.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996a, Historical Release Report 1996 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996b, Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996c, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-167.1

IHSS Number: 167.1
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: Not Applicable
Unit Name: Landfill Spray Field (North Area)

This Final Update to the HRR for PAC NE-167.1, 1 consolidates the information in initial 1992 HRR for the Rocky Flats Plant (DOE 1992) with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 167.1 is summarized in this update. The following HRR volumes contain information concerning IHSS 167.1:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

Approximately October 1974 to May 1981

Historical Summary

The location of IHSS 167.1 is shown on Figures 8 and 9. Originally there were two landfill ponds, the East and West Landfill Ponds. These ponds were intended to protect surface water and groundwater in the vicinity of the Present Landfill. The West Pond was used to collect leachate and surface water runoff from the Present Landfill (PAC NW-114) (DOE 2004). The West Pond was also referred to as Landfill Pond 1 or the Leachate Collection Pond. It originated with the conversion of temporary berms to permanent ones between October 1974 and January 1975 and was in use through May 1981 when the West Landfill Pond was buried as the Present Landfill expanded (DOE 2004).

Spray-evaporation was conducted near the Present Landfill to prevent the release of water from the landfill ponds. Spray fields associated with the Present Landfill included the North Area (IHSS 167.1) and the Central and South Areas (PACs NE-167.2 and NE-167.3). The North Spray Field covered an area of approximately three acres with dimensions of approximately 280 ft by 480 ft (DOE 1992). There were two sources for spray-evaporation water in the North Spray Field. The principal one was the West Landfill Pond. Water from footing drains at Buildings 771 and 774 was also applied to IHSS 167.1 north of the landfill. The water was collected at the Building 771 and Building 774 outfall pond, trucked out to the Landfill area, and then sprinkled from the truck onto the North Spray Field area. After March 1975, the footing drain water was no longer sprayed or spread at the Landfill area because of "damage to the landscape" (DOE 1992).

IHSS Investigations

The water sprayed onto the North Spray Field (IHSS 167.1) may have been contaminated with varying amounts of low-level radioactivity derived from tritium, strontium-90, plutonium, and americium (DOE 1992). Low concentrations of phenol and nitrate were also detected in the spray water. Table NE-5 of the HRR (DOE 1992) lists the activity and concentrations limits for spraying as follows: tritium - 100,000 picocuries per liter (pCi/L); strontium-90 - 25 pCi/L, plutonium - 20 pCi/L, americium - 200 pCi/L above background, and total long-lived alpha - 400 pCi/L. As shown in Table NE-6 of the 1992 HRR (DOE 1992), tritium activity in water ranged from 950 pCi/L to 56,000 pCi/L. The source of spray evaporation water discussed above was either from the landfill pond, collected from the footing drain pond at Buildings 771 and 774, or a combination of both.

IHSS 167.1 was investigated in accordance with the OU 6 RFI/RI Work Plan (DOE 1991). The only VOC detected was toluene at a maximum concentration of 3 µg/kg. The maximum radionuclide activities were 0.024 pCi/g of americium-241, 0.0716 pCi/g of plutonium-239/240, 3.05 pCi/g of uranium-233/234, 0.137 pCi/g of uranium-235, and 141 pCi/g of uranium-238. Additional data are available in the OU 6 RFI/RI report (DOE 1996a) and OU 7 IM/IRA Decision Document (DOE 1996b). These data were developed from analysis of East Landfill Pond water regardless of whether spraying operations were being conducted.

As documented in the OU 6 RFI/RI Report, IHSS 167.1 was identified as an Area of Concern (AOC) based on the results of the CDPHE conservative screen, in accordance with RFCA (DOE et al. 1996), for purposes of the HHRA. The results of the HHRA for the AOC showed that for all current and future on-site receptors, the cumulative HIs for noncarcinogenic health effects were 0.01 or less and therefore no adverse noncarcinogenic health effects were expected under the exposure conditions evaluated. For all current and future on-site residential receptors the excess lifetime cancer risk was estimated at 5×10^{-8} , also indicating negligible risk (DOE 1996a). Additionally, results of the ERA for the Walnut Creek Watershed indicated barium concentrations detected within IHSS 167.1 would pose negligible risks to the small mammal receptor group (DOE 1996a).

No Further Action Recommendation

IHSS 167.1 was proposed for NFA in the 1997 HRR Update (DOE 1997). As proposed this recommendation was consistent with the criteria for recommending NFA decisions presented in RFCA (DOE et al. 1996).

NFA status for IHSS 167.1 was approved in a letter from EPA (the LRA) and CDPHE (CDPHE and EPA 1999) to DOE dated July 9, 1999, that was published in the 1999 HRR Update (DOE 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1991, Final Phase II RFI/RI Work Plan, Walnut Creek Priority Drainage, (Operable Unit No. 6), Rocky Flats Plant, Golden, Colorado, September.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996a, Final Phase I RFI/RI Report Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1996b, Operable Unit 7 Revised Draft IM/IRA Decision Document and Closure Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 1997, Annual Update, August 1, 1996 Through August 1, 1997, Historical Release Report (HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update, August 1, 1998 Through August 1, 1999, Historical Release Report (HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Final Interim Measure/Remedial Action for IHSS 114 and RCRA Closure of the RFETS Present Landfill, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBERS: NE-167.2 AND NE-167.3

IHSS Number: 167.2 and 167.3
Current Operable Unit: BZ
Former Operable Unit: 7
IHSS Group: Not Applicable
Unit Name: Center Area Spray Field (IHSS 167.2)
South Area Spray Field (IHSS 167.3)

This Final Update to the HRR for PACs NE-167.2 and NE-167.3 consolidates the information in the initial 1992 HRR (DOE 1992) with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSSs 167.2 and 167.3 are summarized in this update. The following HRR volumes contain information concerning IHSSs 167.2 and 167.3:

Original Report – 1992 (DOE 1992a);
Update Report – 1996 Annual (DOE 1996a); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1975 to 1994

Historical Summary

The locations of IHSSs 167.2 and 167.3 are shown on Figures 8 and 9. Spray-evaporation of water from the East Landfill Pond began in September 1975 and was discontinued in 1994 (DOE 1992a). During that time, approximately 5,500,000 gallons of water was stored to maintain a 75 percent capacity in the pond. Two discrete spray areas were identified adjacent to the landfill pond; IHSS 167.2 on the northern bank and IHSS 167.3 on the southern bank. These IHSSs were originally part of OU 6 but were transferred to OU 7 in 1994 (DOE 1994). Dimensions of the spray fields were approximately 100 by 460 ft. for IHSS 167.2 and 120 by 440 ft for IHSS 167.3 (DOE 1992a). Surface soil in spray-evaporation areas was potentially contaminated by the landfill pond water. Surface soil downgradient of the East Landfill Pond dam was considered downwind and also potentially contaminated by spray activities (DOE 1992a).

The water sprayed onto the South Area Spray Fields may have been contaminated with varying amounts of low-level radioactivity derived from tritium, strontium, plutonium, and americium (DOE 1996b). Small concentrations of phenol and nitrate were also detected in the spray water.

The original location of the South Area Spray Field as described in the OU 6 Work Plan (DOE 1992b), was south of the OU 7 Landfill on the plateau between an unnamed tributary and North Walnut Creek. During OU 6 characterization activities, it was determined that the South Area Spray Field was actually located further north, adjacent to the south bank of the Present Landfill Pond. The location of IHSS 167.3 was reported in the HRR (DOE 1992a) and based on reevaluation of aerial photographs and other historical records of waste disposal practices was revised in the Final OU 6 Phase I RFI/RI (DOE 1996c).

IHSS Investigations

In accordance with the OU 7 Phase I RFI/RI Work Plan (DOE 1991), five surface soil samples were collected in IHSS 167.2 and three in IHSS 167 from the 0-2 inch soil horizon during the OU 7 Phase I RFI/RI. All samples were analyzed for metals, radionuclides, and indicator parameters (DOE 1996b). Maximum concentrations of metals included 16 mg/kg of arsenic and the maximum activity of americium-241 was 1 pCi/g.

At IHSS 167.2, barium, beryllium manganese, nitrite, americium-241, and plutonium-239/240 were detected at concentrations or activities slightly greater than background. Analytes that were detected at concentrations or activities slightly greater than background at IHSS 167.3 included barium, manganese, lead, zinc, and nitrite (DOE 1996b).

Carcinogenic risk is below the EPA acceptable risk range for incidental ingestion of nonradionuclides, incidental ingestion of radionuclides, particulate inhalation, and external irradiation. Noncarcinogenic risk (HI) is below 1 for incidental ingestion by a child (HI=0.004) and incidental ingestion by an adult (HI=0.0005). These results indicate there is negligible risk to human health from exposure to surface soils downgradient of the landfill for an open space receptor and that the requirements to support a No Action or NFA (as defined by CERCLA) remedy have been met.

No Further Action Recommendation

Based on the OU 7 IM/IRA document and a review of available data by CDPHE and EPA using the consultative process in an NFA Working Group meeting, approval was granted for NFA status for IHSSs 167.2 and 167.3 on November 14, 2001. Approval of the NFA status for IHSSs 167.2 and 167.3 was approved in a letter from CDPHE and EPA (the LRA) to DOE dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

CDPHE, DOE, and EPA, 1991, Rocky Flats Interagency Agreement, Rocky Flats Plant, Golden, Colorado, January 22.

DOE, 1991, Final Phase II RFI/RI Work Plan, Present Landfill IHSS 114 and Inactive Hazardous Waste Storage Area IHSS 203 (Operable Unit No. 7), Rocky Flats Plant, Golden, Colorado, December.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 6-Walnut Creek Priority Drainage, Manual No. 21100-WP-OU 6.01, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Final Work Plan Technical Memorandum for Operable Unit No. 7 – Present Landfill (IHSS 114) and Inactive Hazardous Waste Storage Area (IHSS 203), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996a, Annual Update August 1, 1995 through August 1, 1996, Historical Release Report (HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996b, Operable Unit 7 Revised Draft IM/IRA Decision Document and Closure Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 1996c, Phase I RFI/RI Report Walnut Creek Priority Drainage, Operable Unit No. 6, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, Annual Update August 1, 2001 through August 1, 2002, Historical Release Report (HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-216.1

IHSS Number: 216.1
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: Not Applicable
Unit Name: East Spray Field, North Area

This Final Update to the HRR for PAC NE-216.1 consolidates the information in initial HRR (DOE 1992) with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 216.1 is summarized in this update. The following HRR volumes contain information concerning IHSS 216.1:

Original Report - 1992 (DOE 1992);
Update Report - 1996 Annual (DOE 1996a); and
Update Report - 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

Spring 1989

Historical Summary

The location for IHSS 216.1 is shown on Figures 8 and 9. The north area of the East Spray Field was located on the top of a hill between the A-Series and B-Series Ponds, east of the protected area (PA) fence, and was opened in 1989 because of excessive runoff from the existing spray fields. Surface runoff from this area was collected in the ponds. During its short operational period, the north area of the East Spray Field received water from Pond B-3 (PAC NE-142.7), which received treated sanitary effluent from the on-site sewage treatment facility.

During the time the north area was in operation a chromic acid spill occurred in Building 444 on February 22, 1989 (DOE 1992). This chromic acid was inadvertently pumped to the sanitary sewer system. It was estimated that 4.7 pounds of chromium were discharged to Pond B-3 (DOE 1989) (PAC 000-500). The water from this pond was then sprayed on the north (and south [PAC NE-216.3]) areas of the East Spray Field. This incident required the submittal of a RCRA CIPR (Number 89-001).

Analyses of treated sanitary effluent discharged to Pond B-3 were used to characterize water applied to the East Spray Fields. The chemical analytes included: pH, five day biochemical oxygen demand, total suspended solids (TSS), nitrate as nitrogen, total chromium, total phosphorus, total residual chlorine, and fecal coliform.

In response to the application of water potentially contaminated with chromium to the East Spray Field, soil samples were collected from the spray fields and analyzed for total chromium using the EPA EP Toxicity test in order to measure the amount of chromium that is leachable from the soil. The EP Toxicity chromium analyses of these soil samples indicated background soil concentrations of leachable chromium varied from <0.010 to 0.023 mg/L, and the spray field soils had leachable chromium concentrations of <0.010 to 0.082 mg/L. The data are summarized in the Original HRR (DOE 1992) and again in the 1996 Annual HRR Update (DOE 1996a).

In accordance with the OU 6 RFI/RI Work Plan (DOE 1991), six surface soil samples were collected and analyzed for metals, radionuclides, and total organic carbon (TOC). Americium-241 and plutonium-239/240 were detected at activities of 0.192 pCi/g and 0.758 pCi/g, respectively. In addition, six soil borings were drilled to a depth of 4 ft and sampled in 2-ft intervals. Samples were analyzed for VOCs, metals, radionuclides, and TOC. Three metals and two radionuclides were detected at concentrations or activities greater than background including strontium with a maximum concentration of 506 mg/kg, americium-241 at a maximum concentration of 0.349 pCi/g and plutonium-239/240 at a maximum activity of 0.206 pCi/g. IHSS 216.1 lies in an unsaturated zone between the two drainages; therefore, no groundwater was available for sampling (DOE 1996).

IHSS Investigations

The results of the CDPHE conservative screen, in accordance with RFCA (DOE et al. 1996), for IHSS 216.1, as reported in the final OU 6 Letter Report (DOE 1994), indicated any constituents released to the environment presented negligible risk to the onsite residential receptor. The background comparison conducted as part of the conservative screen resulted in the definition of the inorganic and radionuclide potential contaminants of concern (PCOCs) shown in Table 1 of the 1996 Annual Update to the HRR (DOE 1996a). All organic chemicals detected in the soil samples were considered PCOCs and were also listed in Table 1 of the 1996 Annual Update to the HRR (DOE 1996a).

No Further Action Recommendation

In accordance with RFCA NFA decision criteria (DOE et al. 1996), any area that passed the CDPHE conservative screen was a candidate for NFA. As shown in Table 1 in the 1996 Annual Update (DOE 1996a) the carcinogenic ratio sum was 4.0×10^{-1} and the noncarcinogenic ratio sum was 4.4×10^{-2} . Both of these values were below 1. IHSSs were also assessed for risk due to dermal exposure as indicated in Table 2 of the 1996 Annual Update (DOE 1996a). The noncarcinogenic risk ratio sum for barium and strontium was 3.4×10^{-4} . Again these values were less than 1. Evaluation of data presented in Tables 1 and 2 indicated the risk to human health from exposure to soil at IHSS 216.1 is low (DOE 1996a).

An ERA was also conducted. The results of the ERA for Walnut Creek and Woman Creek watersheds at RFETS, which appeared as Appendix N in the OU 5 RFI/RI report (DOE 1996b), indicated there was no adverse affect to ecological receptors (DOE 1996b).

Based on the above evidence, IHSS 216.1 was proposed for NFA status in the 1996 Annual Update (DOE 1996a). IHSS 216.1 was discussed at the NFA Status Meeting of November 14, 2001, where decision criteria were reviewed and NFA status was granted to IHSS 216.1, the north area of the East Spray Field. Approval of NFA status for IHSS 216.1 was confirmed in a letter from CDPHE and EPA (the LRA) to DOE dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1989, Report of the Chromic Acid Incident Investigation at Rocky Flats, U.S. DOE, Albuquerque Operations Office, Albuquerque, New Mexico, August.

DOE, 1991, Final Phase II RFI/RI Work Plan, Walnut Creek Priority Drainage, (Operable Unit No. 6), Rocky Flats Plant, Golden, Colorado, September.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk-based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment, Walnut Creek Priority Drainage, Operable Unit No. 6, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1996a, Annual Update August 1, 1995 through August 1, 1996, Historical Release Report (HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996b, Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1996c, Final Phase I RFI/RI Report on the Woman Creek Priority Drainage, Operable Unit No. 5, Rocky Flats Environmental Technology Site, Golden, Colorado, April. See Appendix N: Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site.

DOE, 2002, Annual Update August 1, 2001, through August 1, 2002, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CHPHE, and EPA, 1996, Rocky Flats Cleanup Agreement Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: NE-216.2 AND NE-216.3

IHSS Number: 216.2 and 216.3
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: NE/NW
Unit Name: East Spray Fields (Center and South Areas)

This Final Update to the HRR for PACs NE-216.2 and NE-216.3 consolidates the information in initial 1992 HRR and subsequent HRR updates. The disposition of IHSSs 216.2 and 216.3 is summarized in this update. The following HRR volumes contain IHSSs 216.2 and 216.3 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 2003 Annual (DOE 2003).

Date(s) of Operation or Occurrence

PAC NE-216.2 – Center Area: 1979 to the early 1980s

PAC NE-216.3 – South Area: early 1980s to 1990.

Historical Summary

IHSS 216.2 was located immediately north of the East Access Road and was only operated for a few years until it was closed because of erosion and soil slumping problems on hillsides near the spray field. IHSS 216.3 was a considerably larger spray field located immediately south of the East Access Road and was operated for a period of approximately 10 years (DOE 1992). The location of IHSSs 216.2 and 216.3 are shown on Figures 8 and 9.

Spray irrigation of Pond B-3 (PAC NE-142.7) water was initiated in 1979 as an action to achieve zero off-site discharge of sanitary effluent from Rocky Flats. Water from Pond B-3, which received treated sanitary wastewater flows, was applied to these spray fields. Water was pumped from Pond B-3 and spray irrigated on the nearby soil. Gasoline-driven pumps and a series of laterals and sprinkler nozzles distributed the water to the ground surface for evaporation and infiltration into the subsurface. It is estimated that during spray irrigation activities, up to 20 million gallons per year of water was disposed in this manner. When used, the spray system often saturated the soils near the spray fields, leading to overland flow of the sprayed effluent into the retention ponds (DOE 1992).

Direct runoff of spray-irrigated water from the southern portion of the East Spray Field into Woman Creek was observed on March 2, 1987. The direct runoff constituted a technical NPDES violation because the point of discharge to Woman Creek was not an NPDES permitted discharge point (DOE 1992). In response to this NPDES technical violation, a ditch was constructed to divert runoff water from the southern portion of the East Spray Field into Pond C-2 (PAC SE-142.11) (DOE 1992).

A second incident occurred following a spill of chromic acid in Building 444 on February 22, 1989. The chromic acid was inadvertently pumped to the sanitary sewer system and it was estimated that 4.7 lbs of chromium was discharged to Pond B-3. The water from this pond was then spray irrigated on the Southern (and northern) portions of the East Spray Fields.

The analyses of treated sanitary effluent discharged to Pond B-3 and of the pond water is representative of the water applied to the East Spray Fields. Chemical analytes included: pH, five day biochemical oxygen demand, TSS, nitrate as nitrogen, total chromium, total phosphorus, total residual chlorine, and fecal coliform.

In response to the application of water potentially contaminated with chromium to the north and south portions of the East Spray Fields, 34 soil samples were collected. Two of the samples were duplicates. The samples were collected from the ground surface, 0- to 1-inch depth, and from 6- to 7-inch depth. Samples were analyzed for total chromium using the EPA EP Toxicity test in order to measure the amount of chromium that is leachable from the soil. Sampling locations were representative of the application, surface run-off and background areas. The EP Toxicity chromium analyses of these soil samples indicated background soil concentrations of leachable chromium varied from <0.010 to 0.023 mg/L, and the spray field soils had leachable chromium concentrations of <0.010 to 0.082 mg/l (DOE 1992).

IHSS Investigations

IHSSs 216.2 and 216.3 were investigated as part of the OU 2 RFI/RI in accordance with the OU 2 RFI/RI Work Plans (DOE 1991a, 1991b). Results are reported Phase II RFI/RI Report 903 Pad, Mound, and East Trenches Area, Operable Unit No. 2 (DOE 1995). Metals and radionuclides were reported at concentrations and activities greater than background but less than RFCA Tier II soil ALs (DOE et al. 1996) in surface soil (DOE 1995). IHSSs 216.2 and 216.3 were also characterized in accordance with the BZSAP #BZ-02-01 (DOE 2002). This characterization included five surface and one subsurface soil sampling locations in IHSS 216.2. Metals and radionuclides were detected at concentrations or activities greater than background but less than RFCA WRW soil ALs (DOE et al. 2003) in surface soil and toluene was detected, at a maximum concentration of 100 µg/kg in subsurface soil.

Fourteen surface and subsurface soil samples were collected at IHSS 216.3. All surface and subsurface soil results were less than RFCA WRW soil ALs. Metals and radionuclides were detected at concentrations or activities greater than background in surface soil. The maximum radionuclide activities detected included 0.068 pCi/g of americium-241, 0.538 pCi/g of plutonium-239/240, 0.24 pCi/g of uranium-235, and 1.66 pCi/g of uranium-238. Methylene chloride, acetone, ethylbenzene, and total xylenes were detected, at very small concentrations, in subsurface soil.

No Further Action Recommendation

After review of the Data Summary Report for IHSS Group NE/NW (DOE 2003b) by regulatory agencies, DOE received approval from EPA (the LRA) of NFAA status for IHSSs 216.2 and 216.3, on October 7, 2003 (EPA 2003).

Comments

None

References

DOE, 1991a, Technical Memorandum 1, Final Phase II RCRA Facility Investigation/Remedial Investigation Work Plan (Alluvial), 903 Pad, Mound, and East Trenches Areas (Operable Unit No. 2), Rocky Flats Plant, Golden, Colorado, August.

DOE, 1991b, Final Phase II RFI/RI Work Plan (Bedrock), 903 Pad, Mound, and East Trenches Areas (Operable Unit No. 2), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Phase II RFI/RI Report 903 Pad, Mound, and East Trenches Area, Operable Unit No. 2, Vol. 3, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Characterization Data Summary IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2003, G. Kleeman, letter to J. Legare, RE: Characterization Data Summary IHSS Group NE/NW, October 7.

PAC REFERENCE NUMBER: NE-1400

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Tear Gas Powder Release

This Final Update to the HRR for PAC NE-1400 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC NE-1400 is summarized in this update. The following HRR volumes contain PAC NE-1400 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 5, 1987

Historical Summary

A member of Plant Protection dumped approximately 5 pounds of CS tear gas powder on the roadway in the BZ on the evening of August 5, 1987. The location of PAC NE-1400 is shown on Figures 8 and 9. The powder became airborne the next day when other members of Plant Protection drove through the tear gas powder. Three individuals were affected by the powder and were taken to medical and received attention. The area where the tear gas was located was hosed down by the Plant Fire Department.

PAC Investigations

No other investigation required because of the nature of the release.

No Further Action Recommendation

PAC NE-1400 was addressed through the consultative process in an NFA Working Group meeting on January 1, 2002. An NFA for PAC NE-1400 was formally approved by CDPHE and EPA (the LRA) in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-1401

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: NE Buffer Zone Gas Line Break

This Final Update to the HRR for PAC NE-1401 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC NE-1401 is summarized in this update. The following HRR volumes contain PAC NE-1401 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

April 28, 1987

Historical Summary

A 12-inch high-pressure natural gas line was ruptured by a bulldozer during construction of a spray irrigation runoff control ditch in the southeastern BZ. The location of PAC NE-1401 is shown on Figures 8 and 9. The line was reported to be 36 to 42 inches deep. No explosion, fire, or injuries occurred as a result of the rupture; however, overhead electrical lines were damaged by debris blown into the air by the escaping gas. Approximately 5 million cubic feet (ft³) of gas were released to the environment. The flow of gas to the line was shut off. The line was repaired and returned to service on April 30, 1987. Because of the rapid diffusion characteristics of natural gas, it was concluded at the time that the release never presented a hazard to off-site populations.

PAC Investigations

No investigation required because there was no release to soil or water.

No Further Action Recommendation

PAC NE-1401 was addressed through the consultative process in an NFA Working Group meeting on January 1, 2002. An NFA for PAC NE-1401 was formally approved by CDPHE and EPA (the LRA) in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-1402

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: East Inner Gate PCB Spill

This Final Update to the HRR for PAC NE-1402 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC NE-1402 is summarized in this update. The following HRR volumes contain PAC NE-1402 information:

Original Report - 1992 (DOE 1992); and
Update Report - 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 8, 1983

Historical Summary

PCB-contaminated transformer oil leaked onto the asphalt at the east gate. The oil came from a commercial truck which was to pick up a shipment of PCB wastes from the plant. The truck already contained wastes from elsewhere, which apparently were leaking. When the truck was opened for inspection before entering, the leak was noticed. While attempts were being made to clean up the spill, the oil leaked out of the truck and onto the asphalt. The truck left without entering Rocky Flats. The following day, approximately 1 ft² of contaminated asphalt was removed and stored with other Rocky Flats PCB-contaminated waste. The location of PAC NE-1402 is shown on Figures 8 and 9.

PAC Investigations

No investigation was required because the PCB-contaminated waste was contained by the asphalt.

No Further Action Recommendation

PAC NE-1402 was addressed through the consultative process in an NFA Working Group meeting on January 1, 2002. An NFA for PAC NE-1402 was formally approved by CDPHE and EPA (the LRA) in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-1403

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Gasoline Spill - Building 920 Guard Post

This Final Update to the HRR for PAC NE-1403 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC NE-1403 is summarized in this update. The following HRR volumes contain PAC NE-1403 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 5, 1991

Historical Summary

Approximately 1 quart of gasoline spilled from the portable generator in the parking lot asphalt just east of the Building 920 Guard Post. The location of PAC NE-1403 is shown on Figures 8 and 9. The spill was a result of a defective fuel level gauge. The Fire Department responded. The spill was contained by the use of Oil-Dri, an absorbent, and removed from the area. RCRA CIPR No. 91-006 was submitted to CDH as required per 6 Colorado Code of Regulations (CCR) 1007-3, 265.56(j). The report states that the material was released to the asphalt, but was contained and removed immediately. There did not appear to be any threat to the environment. The packaged material was transferred to the Building 331 storage area.

PAC Investigations

No investigation was required because the spill was contained and removed.

No Further Action Recommendation

PAC NE-1403 was addressed through the consultative process in an NFA Working Group meeting on January 1, 2002. An NFA for PAC NE-1403 was formally approved by CDPHE and EPA (the LRA) in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-1404

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 6
IHSS Group: NE/NW
Unit Name: Diesel Spill at Pond B-2 Spillway

This Final Update to the HRR for PAC NE-1404 consolidates the information in the (Second) Quarterly Update for October 1, 1992 through January 1, 1993 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1404 is summarized in this update. The following HRR volumes contain PAC NE-1404 information:

Original Report – Second Quarterly (DOE 1993a);
Update Report – Third Quarterly (DOE 1993b);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 27, 1992

Historical Summary

A diesel spill was reported on October 27, 1992 within the spillway (northeast corner) of Pond B-2 (DOE 1993a). PAC NE-1404 is shown on Figures 8 and 9. Approximately 18 gallons of diesel fuel leaked to the ground from the tank of a portable pump used to transfer water from Pond B-2 to Pond A-2.

The diesel fuel released to the environment was greater than the reportable quantity (RQ) for RCRA-regulated hazardous waste. The EPA waste code for this diesel fuel is D018. The pump was taken out of service for repair (DOE 1993a). The spill was stabilized and contained on the ground by construction of a dike (DOE 1998). The surface of Pond B-2 was cleaned from west to east using absorbent booms and pads (DOE 1998). An estimated 200 pounds of contaminated material (soil and absorbents) were recovered from the spill area and containerized in drums (absorbent booms and pads) and one half crate plywood box (soil) (DOE 1993a). The area was declared a RCRA 90-day accumulation area until analytical data were received on October 29, 1992. The spill and spill area were cleaned up until no visual evidence of contamination was present. The pond area was monitored for a week for evidence of sheen; none was found (DOE 1998).

There was no release to water downstream of RFETS because of the isolation of Pond B-2 water from the normal B-Series Drainage (DOE 1998).

PAC Investigations

Cleanup for this diesel spill was managed as RCRA-regulated waste because the material could contain levels of benzene that exceed the toxicity characteristic leaching procedure (TCLP) limit

(DOE 1993a). Samples collected from the contaminated soil were analyzed for TCLP volatiles and gross alpha beta radiological screens. Results of the TCLP analysis indicated the contaminated soil contained no RCRA-regulated hazardous constituents associated with the release and radiological screens were below background (DOE 1993a).

Soil removed from the spill area was analyzed for TCLP volatiles for waste disposition purposes, VOCs were not detected in the extract (DOE 1993a).

No Further Action Recommendation

Based on the nature of the release and response to the occurrence, a residual source of contamination associated with PAC NE-1404 was not considered likely. PAC NE-1404 was proposed for NFA status in the HRR 1998 Annual Update (DOE 1998), additional information was requested by the agencies in 1999, and NFA approval for PAC NE-1404 was given in a letter from CDPHE and EPA (the LRA) to DOE dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1993a, (Second) Quarterly Update, October 1, 1992 to January 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, January.

DOE, 1993b, (Third) Quarterly Update, January 1, 1993 to April 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, April.

DOE, 1998, Annual Update for August 1, 1997 through August 1, 1998 (HRR) Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update, August 1, 2001 through August 1, 2002, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-1405

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: Not Applicable
Unit Name: OU 2, Phase 2, Field Treatability Unit

This Final Update to the HRR for PAC NE-1405 consolidates the information in the (Second) Quarterly Update for October 1, 1992 through January 1, 1993 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1404 is summarized in this update. The following HRR volumes contain PAC NE-1404 information:

- Original Report – Third Quarterly (DOE 1993a);
- Update Report – Fourth Quarterly (DOE 1993b);
- Update Report – Seventh Quarterly (DOE 1994);
- Update Report – 1998 Annual (DOE 1998); and
- Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

January 14, 1993

Historical Summary

A release of approximately 20 gallons of diesel fuel to the ground due to overfilling of a fuel tank occurred at the OU 2 Treatment Facility. The location of PAC NE-1405 is shown on Figures 8 and 9. The release to the environment was greater than the RQ of RCRA hazardous waste. Cleanup materials from diesel spills were managed as RCRA-regulated waste pending analytical results because the contaminated material potentially contained benzene in excess of the TCLP limit. The EPA waste code for diesel fuel is D018.

The release was cleaned up with absorbent material and later contaminated soil was excavated until all indication of fuel presence was gone (DOE 1993a). Seventeen gray drums were filled the day following the spill with soil contaminated by diesel fuel. Clean road gravel was placed in the excavation as backfill.

PAC Investigations

Prior to excavation of soils in the spill area, sampling was conducted to determine if potential RCRA contaminants were present (DOE 1993a). Six samples (total) were collected from the spill area. Two samples were collected from soil mixed with diesel fuel, two samples were collected from a pool of fuel, and another two samples were collected from a nearby snow bank which absorbed some of the diesel. Analytical data indicated the spilled diesel fuel did not create a RCRA hazard waste. The analysis consisted of target analyte list (TAL) volatile organic analytes (VOAs) and TCLP volatiles.

No Further Action Recommendation

Based on the nature of the release and response to the occurrence, a residual source of contamination associated with PAC NE-1405 was not considered likely. PAC NE-1405 was proposed for NFA status in the 1998 HRR Annual Update (DOE 1998) and approval was given via a letter from the CDPHE and EPA (the LRA) to DOE dated July 9, 1999 (CDPHE and EPA 1999).

Comments

Originally this spill was identified as PAC NE-1404 in the (Third) Quarterly HRR Update (DOE 1993a). It was reassigned as PAC NE-1405 in the (Fourth) Quarterly HRR Update (DOE 1993b).

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1993a, (Third) Quarterly Update, January 1, 1993 to April 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, April.

DOE, 1993b, (Fourth) Quarterly Update, for April 1, 1993 to July 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, July.

DOE, 1994, (Seventh) Quarterly Update, for January 1, 1994 to March 1, 1994, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, April.

DOE, 1998, Annual Update for August 1, 1997 through August 1, 1998 (HRR) Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for August 1, 1998 through August 1, 1999 (HRR) Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NE-1406

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: 771 Hillside Sludge

This Final Update to the HRR for PAC NE-1406 consolidates the information in the (Fourth) Update for April 1, 1993 through July 1, 1993 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1406 is summarized in this update. The following HRR volumes contain PAC NE-1406 information:

Original Report – Fourth Quarterly (DOE 1993);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

Prior to June 1992

Historical Summary

During excavation activities for construction of piping and tanks to store groundwater collected in the SEP area (Modular Storage Tanks, OU 4 area), an 80 by 80 ft area of odoriferous and dark-colored soil was identified (DOE 1993). The location of PAC NE-1406 is shown on Figures 8 and 9. The area in which this material was located was cordoned off to restrict access (DOE 1993). This soil appeared to be highly organic in nature and was thought to be similar to sanitary wastewater treatment plant sludge disposed in other locations on Site. Review of available aerial photographs for the area did not indicate any soil disturbances in this location.

PAC Investigations

The location was surveyed for VOCs and radioactivity (DOE 1998). Samples for laboratory analysis were collected from the area in July, 1992 (DOE 1993). Sample analytes included VOCs, SVOCs, gross alpha/beta, metals, nitrate, ammonia, pH, and fecal coliform bacteria. Analytical results indicated only chromium (22.9 mg/kg) and selenium (3.4 mg/kg) were above (1995) background levels (DOE 1998). These results were well below the RFCA Tier II (DOE 1996) surface soil ALs of 36,740 mg/kg for chromium VI (the more conservative value) and 38,400 mg/kg for selenium.

No Further Action Recommendation

Based on the lack of evidence for contamination, PAC NE-1406 was proposed for NFA status in the 1998 HRR Annual Update (DOE 1998). NFA status was approved for PAC NE-1406 in a letter from CDPHE and EPA (the LRA) to DOE dated July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1993, (Fourth) Quarterly Update, for April 1 1993 through July 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, July.

DOE, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1998, Annual Update for August 1, 1997 through August 1, 1998 (HRR) Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for August 1, 1998 through August 1, 1999 (HRR) Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA and CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from T. Rehder, EPA Regions VIII, S. Gunderson, CDPHE, RE: 1998 Annual HRR Review, Rocky Flats Environmental Technology Site, Golden, Colorado, July 9.

PAC REFERENCE NUMBER: NE-1407

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: NE/NW
Unit Name: OU 2 Treatment Facility

This Final Update to the HRR for PAC NE-1407 consolidates the information in the (Fourth) Quarterly Update for April 1, 1993 through July 1, 1993 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1407 is summarized in this update. The following HRR volumes contain PAC NE-1407 information:

Original Report – Fourth Quarterly (DOE 1993);
Update Report – 2002 Annual (DOE 2002a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

March 9, 1993

Historical Summary

The OU 2 Treatment Facility was located in the 900 Area on the hillside north of Woman Creek and was in operation from May 1991 until August 1995. The location of PAC NE-1407 is shown on Figures 8 and 9. The facility was used primarily to treat contaminated groundwater using a chemical precipitation/micro-filtration/granular activated carbon system. On March 9, 1993 at 3:10 P.M., approximately 50 gallons of untreated seepage/spring water leaked from a ruptured elbow in a secondary containment line near the facility.

Routine sampling of the influent water indicated concentrations of carbon tetrachloride, trichloroethene, tetrachloroethene, chromium, and 1,2-dichloroethene were slightly above the Safe Drinking Water Act (SDWA) drinking water standards (DOE 1993).

In response to the leak, the pump was turned off, and a berm was constructed to contain the spill area within a radius of 150 ft². Analytical data for the influent water suggested that the release did not pose an unacceptable risk to human health and the environment and therefore, immediate removal of the affected soil was not performed.

PAC Investigations

In accordance with BZSAP Addendum #BZ-02-01 for the NE/NW Group (DOE 2002b), characterization samples were collected on June 25, 2002 from five locations. Analytical results from surface and subsurface soil (DOE 2003b) indicated potential contaminant concentrations were less than RFCA Tier II soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

PAC NE-1407 was proposed for, and received, NFAA status via the IHSS Group NE/NW Data Summary Report (DOE 2003b) that received EPA (the LRA) approval in a letter to DOE on October 7, 2003.

Comments

None

References

DOE, 1993, Fourth Quarterly Update, for April 1 1993 through July 1, 1993, Historical Release Report, Rocky Flats Plant, Golden, Colorado, July.

DOE, 2002a Annual Update for August 1, 2001 through August 1, 2002 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2003a, Annual Update for August 1, 2002 through August 1, 2003 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modification Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2003, Correspondence to J. Legare, DOE RFFO from G. Kleeman, EPA RE: Characterization Data Summary IHSS Group NE/NW, October, 7.

PAC REFERENCE NUMBER: NE-1408

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: Not Applicable
Unit Name: OU 2 Test Well Number 219-93

This Final Update to the HRR for PAC NE-1408 consolidates the information in the (Fourth) Quarterly Update for April 1, 1993 through July 1, 1993 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1408 is summarized in this update. The following HRR volumes contain PAC NE-1408 information:

- Original Report – Fourth Quarterly (DOE 1993);
- Update Report – Seventh Quarterly (DOE 1994);
- Update Report – 1999 Annual (DOE 1999); and
- Update Report – 2000 Annual (DOE 2000).

Date(s) of Operation or Occurrence

April 26, 1993

Historical Summary

Approximately 10 gallons of groundwater was spilled when casing being inserted into a new bedrock monitoring well forced water out of the hole and onto the ground (DOE 1993). An area approximately 2 ft by 8 ft was wetted in the incident. The location of PAC NE-1408 is shown on Figures 8 and 9.

At the time of the incident analytical testing of a well 27 ft upgradient identified the following contaminants in the groundwater: carbon tetrachloride, trichloroethene, tetrachloroethene, chloroform, and 1,1-dichloroethene (DOE 1993).

A desiccant was immediately applied to the area to absorb the water and prevent it from spreading (DOE 1993). The wet desiccant, wet dirt from below the desiccant, and a layer of dry dirt were removed from the area and containerized. The wetted material was placed into barrels with "Aqua-Set" absorbent. Approximately 11 ft³, 1-1/2 barrels, of material was removed. The area was cleaned up until dry soil was encountered. Therefore, no additional threat to human health and the environment occurred as a result of this release.

PAC Investigations

In 1999, two confirmation samples were collected under the approved SAP for the Characterization of Potential No Further Action Sites (RMRS 1999). The samples were collected between 0 and 6 inches bgs and no VOCs were detected (DOE 1999).

No Further Action Recommendation

Based on the two confirmation samples and the lack of evidence for a contaminant source, PAC NE-1408 was proposed for NFA status in the 1999 HRR Annual Update (DOE 1999). NFA status was approved for PAC NE-1408 in a letter from CDPHE and EPA (the LRA) to DOE dated June 23, 2000 (CDPHE and EPA 2000).

Comments

None

References

CDPHE and EPA, 2000, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA Region VIII, RE: Annual Update for the Historical Release Report (September 1999), Colorado, June 23.

DOE, 1993, (Fourth) Quarterly Update, for April 1 1993 through July 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, July. PAC NE-1408 was erroneously referred to as PAC NE-1406.

DOE, 1994, (Seventh) Quarterly Update, for January 1, 1994 to March 1, 1994, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, April. The Seventh Quarterly Update corrected the error from the Fourth Quarterly Update regarding reporting of the PAC number.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

RMRS, 1999, Sampling and Analysis Plan for Characterization of Potential No Further Action Sites, RF/RMRS-99-339, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: NE-1409

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: NE/NW
Unit Name: Modular Tanks and Building 910 Treatment System

This Final Update to the HRR for PAC NE-1409 consolidates the information in previous updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1409 is summarized in these updates. The following HRR volumes contain information concerning PAC NE-1409:

- Original Report – Fifth Quarterly (DOE 1993);
- Update Report – Seventh Quarterly (DOE 1994);
- Update Report – 1999 Annual (DOE 1999);
- Update Report – 2000 Interim (DOE 2000a);
- Update Report – 2000 Annual (DOE 2000b);
- Update Report – 2001 Annual (DOE 2001); and
- Update Report – 2002 Annual (DOE 2002a).

Date(s) of Operation or Occurrence

July 20, 1993 to 2003

Historical Summary

Temporary modular storage tanks (MSTs), stored liquid collected by the SEP ITS which was pumped to Building 910 (RCRA Unit 38 which was approved as a non-RCRA unit in 2002 [DOE 2002b]) for treatment. During transfer, approximately 4,700 gallons of hazardous waste in the primary containment, located between the MSTs and the ITS sump, leaked into the secondary containment. This waste overflowed back into the MST pumphouse. The waste was fully contained in the pumphouse secondary containment. When the liquid levels in the pumphouse secondary containment rose, the local alarm was activated and the pumps automatically shut down. This alerted the Building 910 operators to the spill. When the building operators found that liquid was still siphoning out through the pump, they closed the manual valves. The location of PAC 900-NE-1409 is shown on Figures 8 and 9.

Some of the hazardous waste gravity-drained through a failed hose connection on the secondary containment piping located within the ITS sump. The ITS sump was equipped with automatic level controls which caused this spilled material to be pumped back into the MSTs.

The released material was considered RCRA F-listed hazardous waste because it passed through the ITS sump (which was considered a wasted generation point). EPA waste codes for the released material included F001, F002, F003, F005, F006, F007 and F009. RCRA constituents generally existing in the ITS system include cadmium, chromium, lead, nickel, silver, methylene chloride, carbon tetrachloride, chloroform, tetrachloroethene, toluene, trichloromethene, and cyanide.

No release to the environment is known to have occurred from this incident; however, because the concrete sump that received the waste was unlined, the RCRA Contingency Plan was implemented as a precautionary measure (DOE 1994). The MSTs were RCRA closed and demolished in 2002.

PAC Investigation

PAC NE-1409 had not been subject to immediate investigation until construction activities related to the MST Freeze Protection project were initiated in November 1998. Four soil samples were collected at the corner of the ITS sump in December 1998 and January 1999 in support of the Site Survey Determination for Environmental and Worker Exposure, the supporting Soil Disturbance Evaluation and hazardous waste determination requirements. The soil samples were analyzed for metals, radionuclides, SVOCs, and VOCs. Analysis for cyanide was not performed because the waste concentrations were below background concentrations.

Results indicated all analyte concentrations were less than RFCA Tier II soil ALs (DOE et al. 1996). Analytical results are presented in the No Further Action Justification Document for incorporation into the HRR for PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, 900-1313 (DOE 1999). Based on the results of the soil samples collected, no current or potential contaminant source was identified. The incident occurred in 1993 and was not a continuing release. PCOCs for PAC NE-1409 were not detected and therefore PAC NE-1409 is proposed for NFA consistent with criteria set forth in the RFCA (DOE 1996).

No Further Action Recommendation

PAC NE-1409 was proposed for NFA status in the 1999 and 2000 Annual Updates (DOE 1999, 2000b). In response to comments received from the regulatory agencies on June 23, 2000, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (DOE 2000a). The Interim Update included detailed attachments consisting of CPIR No. 93-007 (with amendments), critique meeting notes, analytical data, and maps (36 pages total). The 36-page attachment is not provided in this Annual Update to the HRR, but is available in the AR.

PAC NE-1409 information was evaluated using the consultative process in an NFA Work Group meeting on January 31, 2002 and NFA status was agreed to (DOE 2002b). The NFA for PAC NE-1409 was formally approved by EPA (the LRA) and CDPHE on February 14, 2002 (CDPHE and EPA 2000) as reported in the 2002 HRR Annual Update (DOE 2002b).

Comments

This PAC was formerly identified as PAC 000-503. It was renumbered to better reflect the area of its mapped location.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1993, Fifth Quarterly Update - July 1, 1993 to October 1, 1993, Historical Release Report, Rocky Flats Plant, Golden, Colorado.

DOE, 1994, Seventh Quarterly Update - January 1, 1994 to March 31, 1994, Historical Release Report, Rocky Flats Plant, Golden, Colorado.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000a, Interim Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2000b, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Component Removal RSOP, Rocky Flats Environmental Technology Site, Golden, Colorado.

PAC REFERENCE NUMBER: NE-1410

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: Not Applicable
Unit Name: Diesel Fuel Spills at Field Treatability Unit

This Final Update to the HRR for PAC NE-1410 consolidates the information in previous updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1410 is summarized in this update. The following HRR volumes contain PAC NE-1410 information:

Original Report – Seventh Quarterly; and
Update Report – 2002 Annual (DOE 2002a).

Date(s) of Operation or Occurrence

October 10 and 11, 1993

Historical Summary

On October 10, 1993, Rocky Flats personnel were refueling an emergency generator unit with diesel fuel at OU 2. The operator turned his back on the operation to shield himself from the wind, and when he turned back around, the automatic nozzle valve had not turned off as expected, resulting in approximately 0.5 to 1 gallons of fuel spilling inside the generator unit (DOE 1994). The spill was absorbed with Oil-Dri™. The location of PAC NE-1410 is shown on Figures 8 and 9.

On October 11, 1993 at 9:30 A.M., the generator was being filled again. The OU 2 project manager was conducting a shift inspection at this time and noticed a shiny pool of 2 to 3 gallons of a substance on the ground on the north side of the generator (DOE 1994). The HAZMAT team responded by applying Oil-Dri™ to the standing liquid. Because the soil around the area was very compacted, a backhoe was used to loosen the soil. The affected soil was removed and placed in six 55-gallon gray drums and held by the garage prior to being moved to the Property Utilization and Disposal (PU&D) Yard 90-day RCRA accumulation storage area (DOE 1994).

PAC Investigations

The soil affected by the 2 to 3 gallon diesel spill was removed. The area affected was approximately 200 ft². The spill was not located in an IHSS (DOE 1994). Soil samples were collected from the soil and the bermed area. The samples were determined to be nonhazardous based on sample results because the results were less than regulatory limits for benzene (DOE 1994).

No Further Action Recommendation

Based on the removal of the affected soil and the relatively small quantity of diesel fuel spilled (less than 5 gallons) (DOE 1994), NFA was recommended at the site.

Information on PAC NE-1410 was evaluated through the consultative process at the January 31, 2002 Working Group meeting and NFA status was agreed to. The NFA for PAC NE-1410 was formally approved by CDPHE and EPA (the LRA) on February 14, 2002 (CDPHE and EPA 2002).

Comments

A similar diesel spill occurred on January 14, 1993, and is documented in PAC NE-1405.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1994, (Seventh) Quarterly Update, January 1, 1994 to March 31, 1994, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, April.

DOE, 2002a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, NFA Status Meeting Minutes, Rocky Flats Environmental Technology Site, Golden, Colorado, January 31.

PAC REFERENCE NUMBER: NE-1411

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: Not Applicable
Unit Name: Diesel Fuel Spill at Field Treatability Unit

This Final Update to the HRR for PAC NE-1411 consolidates the information in previous updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC NE-1410 is summarized in this update. The following HRR volumes contain PAC NE-1410 information:

Original Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002a).

Date(s) of Operation or Occurrence

January 29, 1994

Historical Summary

As garage employees were refueling a diesel generator located near OU 2, approximately 20 gallons of diesel fuel were released to the ground. The incident occurred during the transfer of fuel from the generator (Tank B to Tank A). The location of PAC NE-1411 is shown on Figures 8 and 9.

The generator was initially refueled from Tank A, which in turn was refueled through a hose from Tank B. Because of extreme cold, the employees attending the refueling operation were sitting in the truck cab and were not able to hear a problem over the generator noise. When they smelled diesel fumes, they immediately cut the master switch from inside the cab and notified the Shift Supervisor of the spill. It was determined that the back-feed preventer tube on the pump nozzle froze, causing the automatic shut-off to malfunction, releasing approximately 20 gallons of diesel fuel to the ground. Although the generator itself was located within secondary containment, the spill area was not within the containment and diesel was released to the soil (DOE 1994).

The HAZMAT team responded and contained the leak. It was determined that the spill was nonhazardous based on soil characterization. Rocky Flats personnel removed the soil and placed it in barrels (DOE 1994).

PAC Investigations

No additional investigation was required because soil was removed and the spill was determined to be non-hazardous.

No Further Action Recommendation

PAC NE-1411 was proposed for NFA status in the (Seventh) Quarterly Update (DOE 1994). Information on PAC NE-1411 was evaluated through the consultative process at the January 31,

2002 Working Group meeting (DOE 2002b). CDPHE and EPA requested further confirmation that contaminated soil had been removed from the spill site. This information was provided at the next NFA Status Meeting in February in the form of copies of operations logbooks which indicated the contaminated soil had been removed (DOE 2002c). Based on the logbooks PAC NE-1411 was accepted as an NFA site (DOE 2002c). The NFA for PAC NE-1411 was formally approved by CDPHE and EPA (the LRA) on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, (Seventh) Quarterly Update, January 1, 1994 to March 31, 1994, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, April.

DOE, 2002a, Annual Update for the Historical Release Report Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, NFA Status Meeting Minutes for January 31, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado January.

DOE, 2002c, NFA Status Meeting Minutes for February 27, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado February.

PAC REFERENCE NUMBERS: NE-1412 AND NE-1413

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: 2
IHSS Group: NE/NW
Unit Name: Trenches T-12 and T-13,
Located in OU 2, East Trenches

This Final Update to the HRR for PACs NE-1412 and NE-1413 consolidates the information in previous updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PACs NE-1412 and NE-1413 is summarized in this update. The following HRR volumes contain information concerning PACs NE-1412 and NE-1413:

Original Report – Tenth Quarterly (DOE 1995); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

July 1954 to August 1968

Historical Summary

The term “East Trenches” refers to a group of disposal trenches that are located east of the IA and within approximately 400 ft north and south of the East Access Road. All of the East Trenches have similar operational histories, but some have been written up separately for purposes of the Final Update to the HRR. This writeup pertains only to Trenches T-12, and T-13 (PACs NE-1412 and NE-1413). Other trenches in the East Trenches are considered separately in this HRR Update because of having been remediated or proposed for NFAA as separate entities. These other trenches include T-3, T-4, T-7, T-5, T-6, T-8, T-9a, T-9b, T-10, and T-11 (PACs NE-110, and NE-111.1, through 111.8). Figures 8 and 9 indicate the locations of the trenches.

The trenches are variable in length, with the average length being approximately 250 ft (Dow 1971). The trenches are reported to be approximately 10 ft deep and are provided with 2 ft of soil cover.

Trenches T-12 and T-13 were identified and incorporated into the RFI/RI for OU 2 (East Trenches) in June 1993 (DOE 1993) when a Plant employee completed further research of aerial photographs in the East Trench area. Historical documentation indicates that the East Trenches were primarily used to dispose of sanitary wastewater and sludge from the sewage treatment plant drying beds (Building 995 [PAC 900-1300]) until August of 1968. From 1968 to 1970, sanitary wastewater and sludge was taken to the Present Landfill (IHSS 114). The total amount of sludge disposed of in the East Trenches has been estimated to be 125,000 kg (275,577 lb). In general, the East Trenches were documented as being approximately 10 ft deep with several feet of soil cover (DOE 1992).

Trench T-12 was approximately 125 ft long, 10 ft wide, and 5 ft deep (DOE 1996). Trench T-13 was estimated to be nearly 250 ft in length and filled with dark gray material. An employee was

contacted who remembers that this trench may also have contained laboratory wastes (DOE 1996).

The East Trenches (T-3 through T-13) were used primarily for the disposal of sanitary wastewater treatment plant sludge, which consists primarily of concentrated organic matter (Dow 1970). Sludge removed from the wastewater treatment plant was placed on sludge drying beds (PAC 900-1300) and the dried material removed from the sludge drying beds was placed in disposal trenches. An estimated 125,000 kg of sludge is buried in trenches T-2 through T-13 (Rockwell 1983). The sanitary sludge disposal trenches were reported to be approximately 10 ft deep with 2 ft of soil cover (DOE 1992).

Some uranium and plutonium contamination is present in the sludge disposed in the trenches. It is reported that the older sludge would have primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination (Dow 1970). Total reported long-lived alpha activity present in the sludge ranged from a minimum of 382 pCi/g in August 1964 to a maximum of 3591 pCi/g in June 1960 (Dow 1970a).

On at least one occasion it is believed that 2,400 gallons of water and lathe coolant generated in Building 444 was disposed in one of the East Trenches. This waste had an average activity of 150,000 dpm/L. It is believed that this is total alpha activity. The activity of this material was reported as 1.35×10^8 dpm with approximately 1.3 kg of depleted uranium present in the waste (Dow 1964). It is unknown whether this material was in drums.

PAC Investigations

Upon discovery of the two trenches, their characterization was incorporated into the RFI/RI for OU 2 in 1993 (DOE 1993). PACs NE-1412 and NE-1413 were investigated in accordance with the OU2 RFI/RI Work Plans (DOE 1991, 1992) and the results were documented in the Phase II RFI/RI Report (DOE 1995b). In 1995, the PACs were again investigated in accordance with the Trenches and Mound Site Characterization Work Plan (DOE 1995c). Results of this investigation are in the Draft Trenches and Mound Site Characterization Report (DOE 1996). The investigation included electromagnetic (EM-31 and EM-61) surveys, GPR surveys, and borehole sampling.

The results from the RFI/RI indicate only low concentrations of toluene (maximum concentration of 120 $\mu\text{g/kg}$) at Trench T-12. Four metals and five radionuclides were detected at concentrations or activities greater than background. Maximum activities of key radionuclides were 4.85 pCi/g of americium-241, 31.31 pCi/g of plutonium-239/240, and 0.15 pCi/g of uranium-235 (DOE 1995b). No organic compounds were detected at Trench T-12 during the Trenches and Mound Site characterization. Radionuclides were detected at activities greater than background including americium-241 at 0.16 pCi/g, plutonium-239/240 at 0.13 pCi/g, uranium-235 at 2.95 pCi/g, and uranium-238 at 0.8 pCi/g (DOE 1996).

No boreholes were drilled in Trench T-13 during the OU 2 RFI/RI because it was not identified until after the OU 2 field investigation was finished (DOE 1995b). VOCs detected in subsurface soil during the Trenches and Mound Site characterization were near or less than detection limits. Maximum radionuclide activities include 4.23 pCi/g americium-241, 0.46 pCi/g plutonium-239/240, 3.55 pCi/g uranium-233/234, 0.20 pCi/g uranium-235, and 2.43 pCi/g uranium-238 (DOE 1996).

Trenches T-12 and T-13 were sampled in the summer of 2003 as part of the NE/NW Group characterization in accordance with the BZSAP Addendum #BZ-02-01 (DOE 2002). Based on the characterization sampling results presented in the Data Summary Report for IHSS Group NE/NW (DOE 2003b) there were no analytical results above the RFCA WRW soil ALs except for two surface locations identified with plutonium-239/240 activities greater than RFCA WRW soil ALs. Both locations are adjacent to the southern side of Trench T-12 and the measured activities were 133 pCi/g and 88 pCi/g. These detections of surface plutonium were attributed to the 903 Pad Lip Area (PAC 900-155) and remediated as part of the 903 Lip Area IHSS 155 project (DOE 2005). There were no other PCOCs detected at concentrations greater than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

Based on the results of the soil samples collected in accordance with BZSAP Addendum #BZ-02-01 (DOE 2002), NFAA status was proposed for Trenches T-12 (PAC NE-1412) and T-13 (PAC NE-1413) in the IHSS Group NE/NW Data Summary Report (DOE 2003b). NFAA status for PACs NE-1412 and NE-1413 was approved by EPA (the LRA) on October 7, 2003 (EPA 2003).

Comments

The exact dates of operation for the East Trenches are not well documented with exception of the overall period of use from July 29, 1954, through August 14, 1968 (DOE 1992). Trench T-12 (PAC NE-1412) was clearly open in a July 2, 1955 photograph but in 1964 was covered by asphalt due to roadwork as part of the East Access road south bypass (DOE 2003a). Aerial photographs show that Trench T-13 (PAC NE-1413) was open between 1966 and 1967 but entirely covered by asphalt in 1968 when the East Access road north bypass was constructed (DOE 1995).

The 1995 PAC map (DOE 1995) shows Trench T-12 (PAC NE-1412) under the East Access Road North Bypass and Trench T-13 (PAC NE-1413) under the South bypass. The opposite is true and in subsequent HRR the maps have been corrected.

References

DOE, 1991a, Technical Memorandum 1, Final Phase II RCRA Facility Investigation/Remedial Investigation Work Plan (Alluvial), 903 Pad, Mound, and East Trenches Areas (Operable Unit No. 2), Rocky Flats Plant, Golden, Colorado, August.

DOE, 1991b, Final Phase II RFI/RI Work Plan (Bedrock), 903 Pad, Mound, and East Trenches Areas (Operable Unit No. 2), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1993, Phase I Remedial Investigation OU 2 (East Trenches), Rocky Flats Plant, Golden, Colorado, December.

DOE, 1995a, (Tenth) Quarterly Update for September 30, 1994 Through December 31, 1994 Historical Release Report (HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1995b, Phase II RFI/RI Report 903 Pad, Mound, and East Trenches Area, Operable Unit No. 2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

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






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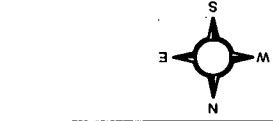
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NW Area

Figure 10
Northwest Buffer Zone Area
IHSSs and PACs

KEY

-  Streams
-  Dirt roads
-  PAC
-  IHSS
-  HRR area
-  Lakes
-  Asphalt
-  Building



Scale = 1: 15150
0 750 Feet

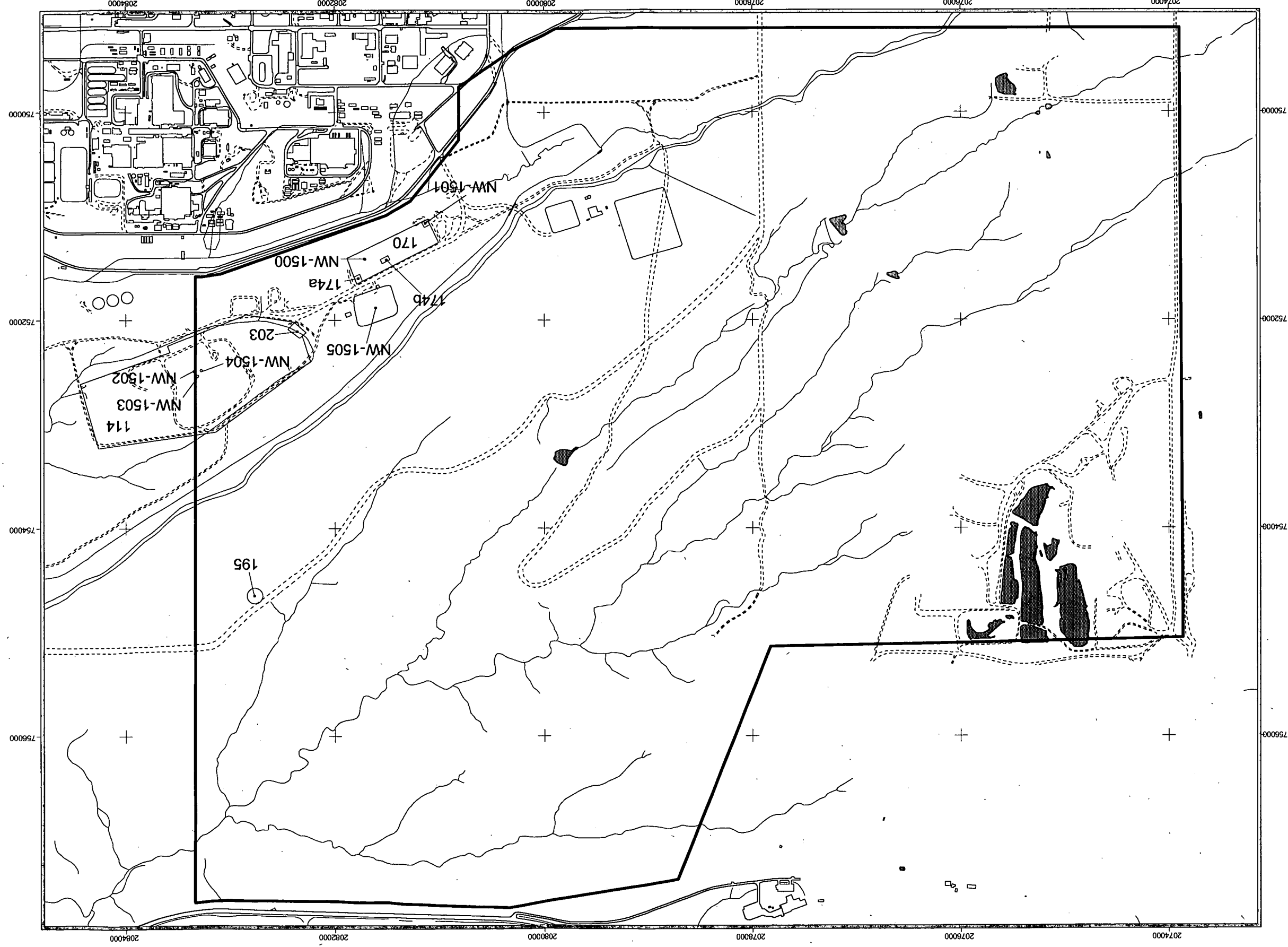
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 09.27.05



File: W:\Projects\FY2005\HRR Update\Figures\hrr_NW_BZ.apr



PAC REFERENCE NUMBER: NW-114

IHSS Number: 114
Current Operable Unit: BZ
Former Operable Unit: 7
IHSS Group: 000-5
Unit Name: Present Landfill

The Final Update to the HRR for PAC NW-114 consolidates the information presented in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 114 is summarized in this update. The following HRR volumes contain IHSS 114 information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

August 1968 to March 1998

Historical Summary

The landfill was constructed in August 1968 for the disposal of the Plant's uncontaminated solid wastes. The location of the Present Landfill is shown on Figure 10. The development and use of this landfill replaced the incinerator (PAC SW-133.5) and Original Landfill (PAC SW-115) as the method of sanitary solid waste disposal. For the purpose of this historical summary, much of the background history has been summarized. The complete operational history of the Present Landfill is detailed in the original HRR (DOE 1992). Detailed drawings and figures showing the location of wells, leachate collection systems, ponds, and other IHSSs within the IHSS 114 boundary can be found in the Final Phase 1 RFI/RI Work Plan (DOE 1991) and the OU 7 Final Work Plan, Technical Memorandum (DOE 1994).

The landfill was used for the disposal of general Rocky Flats refuse collected from various locations throughout the Plant. Refuse from production areas was monitored and approved by appropriate on-site supervisors prior to placement in dumpsters. Liquids, sludge, or non-contaminated potentially hazardous solid materials were reviewed and required to meet Plant specifications to be accepted for disposal. Waste types included paper, rags, floor sweepings, cartons, demolition material, sanitary wastewater treatment plant sludge, asbestos, PCBs and other miscellaneous items (DOE 1992).

In October 1972, Rocky Flats policies on waste disposal at the landfill were reviewed and judged to be in accordance with applicable regulations. Regulatory guidelines were issued in 1973 to control burial of solid and liquid wastes in the Present Landfill prompting Site Staff to initiate a program of radioactive monitoring and scanning of the wastes. In 1977, a Solid Waste Management Plan was prepared in compliance with 40 Code of Federal Regulations (CFR) 241 that included both radiation and groundwater monitoring programs. CDH inspected the landfill in 1978 and 1979 at which time the landfill was reported to comply with minimum state and federal standards. Because hazardous waste was disposed of at the landfill, it was designated as an interim status RCRA regulated unit and was included in the 1986 Part B Permit Application.

Radioactively contaminated sludge from the sanitary wastewater treatment plant (Building 995) was routinely disposed of in the Present Landfill from August 1968 through May 1970. The contamination consisted of uranium and plutonium which had entered the sanitary sewage system with laundry water. This practice was discontinued in May 1970 when off-site shipment of sludge as low-level waste began (DOE 1992).

Tritium was discovered in the landfill drainage in 1973. Tritium activity concentrations in surface water were greatest downgradient of the landfill, with the highest concentration of 91,800 pCi/L in September 1973. Groundwater samples from monitoring wells placed in the landfill had the greatest concentration of tritium activity (301,609 pCi/L). The tritium activity concentrations steadily decreased with time and were within measured background values by 1987 at which time, no migration of tritium had been identified downgradient or laterally from the landfill (DOE 1992).

Hazardous waste that routinely went to the landfill included four categories: 1) containers partially filled with paint, solvents, and foam polymers; 2) wipes and rags contaminated with listed hazardous wastes; 3) filters, typically including silicone oil filters, paint filters, and other miscellaneous filters that may have contained hazardous constituents; and 4) metal cuttings and shavings, including mineral and asbestos dust and metal chips coated with hydraulic oil and organic solvents. This disposal of wastes with hazardous constituents ceased in the fall of 1986 (DOE 1992).

In 1985, asbestos generated on site was disposed of in a designated area which consisted of a 10-ft deep pit in the Present Landfill. This operation was evaluated in 1985 and considered in compliance with the appropriate Federal regulations. By December 1988, asbestos was disposed of in several pits in specified areas near the center of the landfill.

Small quantities of PCBs are contained in materials that were routinely disposed of in the landfill. In 1976, it was determined used fluorescent light ballasts could no longer be sent to the landfill because they contained small quantities of PCBs.

IHSS Investigations

In response to the elevated tritium levels mentioned above, 52 monitoring wells were drilled into the landfill itself to identify the source of the elevated tritium activity concentrations. Initially, 21 test wells were drilled about 25 ft deep and cased with plastic pipe. The pattern of these was a grid of 100-ft spacing down the centerline of the landfill. Samples collected from the wells contained background amounts of tritium activity except for the area of the landfill used in 1970, which had up to 36,000 pCi/L.

When RCRA regulations were implemented at Rocky Flats, the landfill was designated as a regulated unit because hazardous waste had been disposed of in it. Because it was a land disposal unit, groundwater monitoring was required. Four wells were installed in the immediate vicinity in 1986; 16 wells in 1987, and 13 wells in 1989 for a total of 33 monitoring wells to monitor the groundwater near and in the landfill. These wells monitored water in both the alluvium and bedrock. Results of groundwater quality analyses are presented in the Annual RCRA Groundwater Monitoring Reports for Regulated Units produced each year at RFETS.

A Final Phase I RFI/RI Work Plan (DOE 1991) was completed in December of 1991, and analytical data collected underwent rigorous review and data quality evaluation as part of the OU 7 Final Work Plan, Technical Memorandum (DOE 1994).

Surface soil samples were collected from the western end of the landfill, across IHSS 114 – Present Landfill, and in the vicinity of the East Landfill Pond, including the spray areas (within the former OU 7 area). Surface soil samples from the western end of the landfill were analyzed for PCBs, metals, radionuclides, and nitrate as nitrogen. Surface soil samples from IHSS 114 – Present Landfill were analyzed for SVOCs, metals, inorganics, radionuclides, and asbestos. Surface soil samples from the vicinity of the East Landfill Pond were analyzed for radionuclides, metals, and nitrate as nitrogen (DOE 1994). The surface soil data indicated some metals, radionuclides, and SVOCs were present at concentrations greater than background (that is, background means plus two standard deviations) for metals or the method detection limits (MDLs) for SVOCs. All potential contaminant concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).

Subsurface soil samples were collected from IHSS 114 – Present Landfill, including the spray areas (within the former OU 7 area). Samples were collected from 2-ft intervals in alluvium and 4-ft intervals in bedrock. The deepest samples collected ranged from a depth of 22 to 60 ft. Subsurface soil samples were analyzed for metals, PCBs, radionuclides, SVOCs, VOCs, and nitrate as N. The subsurface soil data indicated some metals, radionuclides, SVOCs, and VOCs were present at concentrations greater than background (for metals) or MDLs (for SVOCs and VOCs). All potential contaminant concentrations were less than RFCA WRW soil ALs.

There are four upgradient RCRA wells and four downgradient RCRA wells. For the upgradient RCRA wells, there were very few concentrations of VOCs at concentrations greater than RFCA Tier II groundwater ALs and very few detections of VOCs overall. Tetrachloroethene, trichloroethene and 1,1-dichloroethane were detected in two wells at concentrations greater than RFCA Tier II groundwater ALs (DOE et al. 1996). The concentrations show little variation with time and are near the RFCA Tier II groundwater ALs. Only trichloroethene is found at a concentration greater than the RFCA Tier II groundwater AL for every sampling event, ranging from 10 to 22.6 µg/L.

At the downgradient RCRA wells, selenium (ranging from 196 to 410 µg/L) and lithium (ranging from 1,100 to 2,140 µg/L) concentrations were greater than RFCA Tier II groundwater ALs, and thallium results were present at concentrations greater than RFCA Tier II groundwater ALs, ranging from 2.4 to 4.6 µg/L. For the upgradient RCRA wells, the only metals detections above RFCA Tier II groundwater ALs were for thallium. The range of the detections was 2.2 to 6.2 µg/L.

All of the downgradient RCRA wells contained RFCA Tier II groundwater AL exceedances for uranium-233/234 and uranium-238. The upgradient RCRA wells had very few Tier II exceedances for uranium isotopes, and the magnitude of the exceedances are lower by over an order of magnitude when compared to downgradient wells. All but one of the uranium-233/234 and uranium-238 RFCA Tier II groundwater AL exceedances in the upgradient wells were from weathered bedrock.

Data from wells in the landfill vicinity indicated the highest concentrations of tritium occurred at wells located near the center of the landfill. Concentrations have been as high as 3,500 pCi/L but are considerably lower at the northern edge of the landfill and farther downgradient, indicating the high concentrations of tritium are localized. All of these reported concentrations are well below the RFCA Tier II groundwater AL of 20,000 pCi/L. Only one well had a reported

strontium-89/90 concentration that exceeded the RFCA Tier II groundwater AL of 0.852 pCi/L. This exceedance was a single occurrence in 1991.

A RFCA accelerated action (DOE et al. 1996) at IHSS 114 was conducted in accordance with the Final IM/IRA for IHSS 114 and RCRA Closure of the RFETS Present Landfill (DOE 2004), which was approved by the regulatory agencies in August 2004. The accelerated action activities primarily included the removal of pond sediments and placing them in an area under the RCRA cover, constructing a RCRA Subtitle C-compliant cover and associated work, and installing new groundwater monitoring wells (DOE 2005). The accelerated action activities were documented in the Accelerated Action for the Present Landfill RFETS Construction Certification Report, Volumes 1 through 4 (Attachment A of the Closeout Report for IHSS Group 000-5; DOE 2005).

No Further Action Recommendation

After review of the Final Closeout Report for IHSS Group 000-5, Present Landfill, IHSS 114 (DOE 2005) by the regulatory agencies, DOE received approval from EPA (the LRA) of the NFAA status for IHSS 114 on September __, 2005 (EPA 2005).

Comments

None

References

DOE, 1991, Final Phase I Resource Conservation and Recovery Act Facility Investigation Remedial Investigation Work Plan; Rocky Flats Plant Present Landfill IHSS 114 and Inactive/Hazardous Waste Storage Area IHSS 203 (Operable Unit No. 7), Rocky Flats Plant, Golden, Colorado, December.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Final Work Plan, Operable Unit 7, Present Landfill (IHSS 114) and Inactive Hazardous Waste Storage Area (IHSS 203), Technical Memorandum, Volume 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Final Interim Measure/Interim Remedial Action for IHSS 114 and RCRA Closure of the RFETS Present Landfill, RFPO, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Closeout Report for IHSS Group 000-5, Present Landfill (IHSS 114), Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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EPA, 2005, Correspondence to J. Rampe, DOE RFPO, from __, EPA Region VIII, RE: Closeout Report for IHSS Group 000-5, September __.

PAC REFERENCE NUMBER: NW-170

IHSS Number: 170
Current Operable Unit: BZ
Former Operable Unit: 10
IHSS Group: Not Applicable
Unit Name: PU&D Storage Yard

The Final Update to the HRR for PAC NW-170 consolidates the information presented in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 170 is summarized in this update. The following HRR volumes contain IHSS 170 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997a);
Update Report – 1998 Annual (DOE 1998);
Update Report – 1999 Annual (DOE 1999); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1974 to 1994

Historical Summary

The location of IHSS 170 is shown on Figure 10. Historically, the PU&D storage yard was used for storing empty drums and dumpsters, cargo boxes, cable spools, and similar materials. The yard was divided in thirds with wire fences. The eastern third was used for storage of scrap metal and encompassed the drum (PAC NW-174a) and dumpster (PAC NW-174b) storage areas. The center third was used for the storage of equipment such as stainless steel tanks. The western third was used for the storage of excess property. The greatest potential for contamination was considered the eastern third because scrap metal may have been stored without prior decontamination and hazardous materials in drums and dumpsters were transferred in this area of the yard (DOE 1992a). Storage in these areas stopped in 1994 and all containers and debris were removed (DOE 1997b).

IHSS Investigations

Assessment of environmental contamination attributable to PU&D Yard operations was initiated as part of the OU 10 Phase I RFI/RI (DOE 1995). In 1993, 37 surface soil samples were collected from IHSS 170 and analyzed for total metals, SVOCs, pesticides, and PCBs in accordance with the OU 10 RFI/RI Workplan (DOE 1992b). No results were above RFCA Tier I surface soil ALs (DOE et al. 1996). Arsenic was present at a maximum concentration of 9 mg/kg (IHSS 174a). Aroclor-1254 was detected twice; the maximum value was 330 µg/kg. Several PAHs were detected a number of times, and the maximum benzo(a)pyrene concentration was 270 µg/kg, less than Tier II surface soil ALs. Forty-six locations within and adjacent to IHSSs 170, 174a, and 174b also were surveyed with a high-purity germanium (HPGe) detector, and no anomalous radionuclide activities were observed. In 1994, approximately 235 soil gas

locations were sampled within and adjacent to IHSSs 170, 174a, and 174b for VOC analysis. Soil gas results at IHSS 170 were low. The highest detection was methane at 220 ppm. The data are presented in the Draft Technical Memorandum 1, OU 10, Other Outside Closures (DOE 1995), and show VOCs were potentially present in subsurface soils along the eastern third of the PU&D Yard.

Based upon these results, a pre-remedial investigation of IHSSs 170, 174a, and 174b was performed in August 1997 (DOE 1997b) to investigate the potential presence of a VOC contaminant source. The investigation consisted of 20 soil borings and 38 subsurface soil samples over IHSSs 170, 174a, and 174b. Borehole locations corresponded with areas where VOC detections in soil gas samples were observed in the 1994 survey and were biased to the eastern third of the IHSS. Two boreholes were also placed in areas of visibly stained soil. No VOC contaminants of concern (tetrachloroethene, trichloroethene, and 1,1,1-tetrachloroethane) were detected in subsurface soil samples from IHSS 170 (DOE 1997c). Methylene chloride was detected in several of the subsurface soil samples; however, the contaminant was also detected in the method blank associated with the analyses and is most likely attributable to laboratory contamination. Naphthalene was estimated in one sample from borehole 17,897 at 390 µg/kg, substantially below the RFCA Tier II subsurface soil ALs of 101,000 µg/kg (DOE et al. 1996). Isotopic results were below background levels where measured. Detailed figures for IHSSs 170, 174a, and 174b can be found in the Pre-Remedial Investigation document for IHSSs 170, 174a, and 174b (DOE 1997b).

Six groundwater samples were collected during the pre-remedial investigation of IHSSs 170, 174a, and 174b. Three of the six samples were within the IHSS 170 boundary. The tetrachloroethene concentration of 15 µg/L detected in groundwater, from borehole 18197, is above the RFCA Tier II groundwater AL of 5 µg/L (DOE et al. 1996). Trichlorotrifluoroethane was also detected in groundwater from IHSS 170, which also may indicate impact from past practices (that is, Freon-based lathe coolant). The 1,1,1-trichloroethane concentration of 6.3 µg/L was below the RFCA Tier II groundwater AL of 200 µg/L (DOE et al. 1996).

In September of 2001, it was determined a source of VOCs was present in the northeastern corner of the PU&D Yard (IHSS 174a) as stated in the Final PU&D Yard Plume Enhanced Natural Attenuation Treatability Study Report (DOE 2001). The primary contaminant identified was tetrachloroethene (5,700 µg/kg) at a depth of 11 ft. The RFCA Tier I AL was 3,150 µg/kg (DOE et al. 1996). Hydrogen Release Compound[®] (HRC[®]) was introduced (injected) into the area under investigation to enhance natural attenuation of VOCs.

In 2005, soil at two locations near IHSS 170 with vanadium concentrations greater than RFCA WRW soil ALs were excavated.

No Further Action Recommendation

No surface or subsurface soil analyses demonstrated the presence of contaminants above RFCA Tier II surface soil ALs in IHSS 170 (with exception to IHSS 174a). IHSS 170 was addressed using the consultative process at an NFA Working Group meeting on February 27, 2002. Based upon these discussions, NFAA was verbally approved and formally approved in a letter from CDPHE (the LRA) and EPA dated September 26, 2002 (CDPHE and EPA 2002).

Comments

IHSS 170 overlaps with IHSS 174a, IHSS 174b, PAC-NW-1500, and PAC-NW-1501. IHSS 170 may be the location of PIC 51.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFPO; from S. Gunderson, CDPHE; and R. Rehder, EPA RE: Approval of NFA designations for IHSSs, PACs, and PICs, September 26.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase 1, RFI/RI Workplan, Rocky Flats Plant, Other Outside Closures, Operable Unit 10, Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Draft Technical Memorandum 1, OU 10, Other Outside Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Final Sampling and Analysis Plan for the Pre-Remedial Investigation of IHSSs 170, 174a and 174b, Property Utilization & Storage Yard, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1997c, Data Summary Report for IHSSs 170, 174a, and 174b, Property Utilization and Storage Yard, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Final PU&D Yard Plume Enhanced Natural Attenuation Treatability Study, Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: NW-174a

IHSS Number: 174a
Current Operable Unit: BZ
Former Operable Unit: 10
IHSS Group: NE/NW
Unit Name: Property Utilization & Disposal Drum Storage Facility

The Final Update to the HRR for PAC NW-174a consolidates the information presented in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 174a is summarized in this update. The following HRR volumes contain IHSS 174a information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1974 to 1994

Historical Summary

The location of IHSS 174a is shown on Figure 10. IHSS 174a was one of two areas within the PU&D Storage Yard (IHSS 170) designated for container storage. One area stored drums (IHSS 174a) and the other was designated for a dumpster (IHSS174b). Until August 1985, the drum storage area was used for the storage of RCRA-regulated waste. After 1985 it was used for the storage of empty drums. Storage in these areas stopped in 1994 and all containers and debris were removed (RMRS 1997).

Drums were routinely monitored for radiation prior to shipment to the PU&D Yard. In addition, the contents of drums originating from areas that handled radioactive materials were sampled and analyzed prior to shipment to the PU&D Yard. At times, the level of radioactivity set for acceptance in the Yard was exceeded, and drums were returned to their building of origin (DOE 1992a, 2003a).

Most of the drums associated with IHSS 174a held waste oils that contained hazardous constituents, waste paints, and spent paint thinner. Waste oils were typically derived from equipment and vehicle maintenance activities. Visual monitoring of the drum storage area was conducted periodically, and visible staining on the ground surface was documented. However, no documentation of leaks or spills could be identified (DOE 2003a).

An incident in May 1982 identified two drums of liquid stored in the PU&D storage area (IHSS 174a) as being pressurized with bulging drum heads. A third drum was noted to have the bottom blown out. The drums were moved to the hazardous waste storage area (PAC NW 203) west of the Present Landfill and the contents identified. No documentation was found that indicated a release to the environment as a result of these damaged drums. No other documentation was found describing other releases to the environment (DOE 2003a).

IHSS Investigations

As described in the writeup for IHSS NW-170, assessment of contamination attributable to PU&D Yard operations was initiated in accordance with the OU 10 RFI/RI Workplan (DOE 1992b). In 1994, approximately 235 soil gas locations were sampled for VOC analysis, and 71 surface soil locations were sampled and analyzed for metals, SVOCs, pesticides, and PCBs. The soil gas data indicated VOCs were potentially present in subsurface soil along the eastern third of the yard (DOE 2003b).

In September 2001, it was determined a source of VOCs was present in the northeastern corner of the PU&D Yard (IHSS 174a) as stated in the Final PU&D Yard Plume Enhanced Natural Attenuation Treatability Study Report (DOE 2001). Based on the subsurface soil sampling data, residual tetrachloroethene contamination (5,700 µg/kg) was identified at a depth of 11 ft. The RFCA Tier I soil AL was 3,150 µg/kg (DOE et al. 1996). The RFCA WRW soil AL is 615,000 µg/kg (DOE et al. 2003). Analytical results are presented in the Data Summary Report for IHSS Group NE/NW (DOE 2003b). Total metals, radionuclides, SVOCs, VOCs, PCBs, and pesticides were also analyzed in accordance with BZSAP Addendum #BZ-02-01 (DOE 2002). Results indicated that all contaminant activities and concentrations were below WRW soil ALs (DOE 2003b).

HRC[®] was introduced (injected) into the area under investigation to enhance natural attenuation of VOCs (refer to writeup for PAC NW-170; DOE 2001).

No Further Action Recommendation

Based upon the analytical data for surficial and subsurface soils, the SSRS, and the introduction of HRC[®], IHSS 174a was approved for NFAA as part of the IHSS Group NE/NW Data Summary Report (DOE 2003b) in a letter from the EPA (the LRA) dated October 7, 2003 (EPA 2003).

Comments

None

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I, RFI/RI Workplan, Rocky Flats Plant, Other Outside Closures, Operable Unit 10, Rocky Flats Plant, Golden, Colorado, May.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Final PU&D Yard Plume Enhanced Natural Attenuation Treatability Study, Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, BZSAP Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2003, Correspondence, to J. Legare, DOE RFFO, from G. Kleeman, EPA, RE: Characterization Data Summary IHSS Group NE/NW, October 7.

RMRS, 1997, Final Sampling and Analysis Plan for the Pre-Remedial Investigation of IHSSs 170, 174a and 174b, Property Utilization & Storage Yard, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

PAC REFERENCE NUMBER: NW-174b

IHSS Number: 174b
Current Operable Unit: BZ
Former Operable Unit: 10
IHSS Group: Not Applicable
Unit Name: Property Utilization & Disposal Drum Storage Facility

The Final Update to the HRR for PAC NW-174b consolidates the information presented in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 174b is summarized in this update. The following HRR volumes contain IHSS 174b information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1974 to 1994

Historical Summary

The location of IHSS 174b is shown on Figure 10. IHSS 174b was a dumpster storage site. Dumpsters were moved to the storage area when filled and were stored directly on the ground surface (resulting in the designation of IHSS 174b) prior to shipment for off-site recycling (DOE 1992). Storage in these areas stopped in 1994 and all containers and debris were removed (RMRS 1997a).

The dumpster storage area was used for the storage of stainless steel chips coated with Freon-based or oil-based lathe coolant (DOE 1992). Radioactive contamination of the chips was not expected because of the presence of administrative controls to prevent radioactively contaminated material from being shipped to the PU&D Yard. Visible staining was apparent on the soil in the dumpster storage area from spills which occurred during transfer and from rainwater washing residual oil from metal shavings onto the ground within IHSS 174b (DOE 1992).

IHSS Investigations

Assessment of environmental contamination attributable to PU&D Yard operations was initiated as part of the OU 10 Phase I RFI/RI. In accordance with the OU 10 RFI/RI Work Plan (DOE 1992b), approximately 235 soil gas locations were sampled within and adjacent to IHSSs 170, 174a, and 174b for VOC analysis (EG&G 1995). VOCs are potentially present in subsurface soils along the eastern third of the yard; however, there were no VOCs detected at concentrations greater than 1 µg/L in soil gas.

Based on the analytical results from the pre-remedial investigation, a VOC contaminant source equal to or above the RFCA Tier I subsurface soil ALs (RMRS 1997a) was not identified in IHSS 174b (DOE 1999). The PCE concentration of 1,700 µg/L detected in groundwater from

borehole 17497 is greater than the RFCA Tier I and Tier II groundwater ALs of 500 and 5 µg/L, respectively (DOE et al. 1996). Trichlorotrifluoroethane was also detected in groundwater from IHSS 174b.

Based on the subsurface soil sampling data, no current or potential source of contamination associated with IHSS 174b could be identified. Trichlorotrifluoroethane, detected in groundwater, was not detected in the subsurface soil. As a result, IHSS 174b was proposed for NFA in 1999 (DOE 1999).

No Further Action Recommendation

Based upon the analytical data submitted to the regulatory agencies in the 1998 HRR Annual Update to the HRR (DOE 1998), IHSS NW-174b was approved for NFA in a letter from CDPHE and EPA (the LRA) dated July 9, 1999 (CDPHE and EPA 1999).

Comments

IHSS 174b is within PAC NW-170.

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1998), July 9.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan, Other Outside Closures (Operable Unit No. 10, Rocky Flats Plant, Golden, Colorado, May.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EG&G, 1995, Draft Technical Memorandum 1, OU 10, Other Outside Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

RMRS, 1997a, Final Sampling and Analysis Plan for the Pre-Remedial Investigation of IHSSs 170, 174a and 174b, Property Utilization & Storage Yard, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

PAC REFERENCE NUMBER: NW-195

IHSS Number: 195
Current Operable Unit: BZ
Former Operable Unit 16
IHSS Group: Not Applicable
Unit Name: Nickel Carbonyl Disposal

The Final Update to the HRR for PAC NW-195 consolidates the information presented in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 195 is summarized in this update. The following HRR volumes contain IHSS 195 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1996 Annual (DOE 1996).

Date(s) of Operation or Occurrence

March 1972 to August 1972

Historical Summary

The location of IHSS 195 is shown on Figure 10. From March through August 1972, cylinders of nickel carbonyl were disposed of in a dry well located in the BZ. The cylinders were opened inside the well and vented with small arms fire (nickel carbonyl vapors are denser than air) (DOE 1992a).

Cylinders were later removed from the hole, and buried in the Present Landfill (PAC NW-114). Two cylinders could not be removed and were buried in place. Samples from the lip of the well were collected after the initial disposal indicated nickel carbonyl concentrations of approximately 10 ppm being released during disposal (DOE 1992a, 1992b). This IHSS was then investigated in accordance with the IAG as part of OU 16 (DOE 1992b).

IHSS Investigations

No other IHSS 195 investigations were deemed necessary.

No Further Action Recommendation

Based on information presented in the Final No Further Action Justification Document for OU 16, Low-Priority Sites (DOE 1992b), the CAD/ROD for OU 16 requiring no action for IHSS 195 was approved on October 28, 1994 (DOE 1996).

Comments

CERCLA Five Year Review: The CAD/ROD for OU 16 (DOE 1994) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Corrective Action Decision/Record of Decision for OU16: Low Priority Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NW-203

IHSS Number: 203
Current Operable Unit: BZ
Former Operable Unit: 7
IHSS Group: Not Applicable
Unit Name: Inactive Hazardous Waste Storage Area

The Final Update to the HRR for PAC NW-203 consolidates the information presented in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 203 is summarized in this update. The following HRR volumes contain IHSS 203 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996a);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1986 to 1988

Historical Summary

An area at the southwestern portion, and within, the Present Landfill (PAC NW-114) was operated as a hazardous waste storage area for both drummed solid and liquid wastes. All containers with free liquids were stored within two 40-ft cargo containers with interior secondary containment. Some drums containing only solid waste were stored outside. At maximum capacity, the area consisted of eight 20-ft-long cargo containers and six 40-ft cargo containers. A total of 384 55-gallon drums could be stored. Two of the containers were used to store PCB-contaminated soil and debris and PCB-contaminated transformer oil (DOE 1992). The location of IHSS 203 is shown on Figure 10.

A small spill (less than 4 fluid ounces) from a leaking drum was discovered in a cargo container June 21, 1988. The material had traces of PCBs. The drum was placed into an 83-gallon overpack drum and the cleanup material was placed in a waste drum (DOE 1992).

Miscellaneous solid and liquid hazardous, nonradioactive wastes containing organic compounds and PCBs were stored at this site. Controls, which met regulatory standards, were in place to prevent leaks and spills. Spills of less than reportable quantities may have occurred from the drums during transfer of materials into and out of the drums. Because of the distance of the area from plant operations, this area was considered inconvenient for use as a hazardous waste storage area. The use of this area stopped in 1988.

IHSS Investigations

The area was investigated as described in the OU 7 Phase I RFI/RI Work Plan (DOE 1991). These data were presented in the Final Work Plan Technical Memorandum for OU 7 (DOE 1994).

Concentrations of VOCs in soil gas varied significantly within the sampling area and, as a result, a distinct source area was not identified. Because landfill wastes underlie IHSS 203, it was concluded VOCs in soil gas in this area were probably associated with the landfill waste rather than potential releases from IHSS 203 (DOE 1996b).

Surface soil samples were collected at 49 locations from 0 to 2 inches and from 18 locations from 0 to 10 inches. Based on the suspected contaminants, the samples were analyzed for PCBs, metals, and radionuclides. The analytical results for all analytes were below RFCA Tier II soil ALs (DOE et al. 1996) and below current WRW soil ALs (DOE et al. 2003). Analytical data for IHSS 203 are presented in Table 1 (page 38) of the 1998 Annual Update for the HRR (DOE 1998).

No Further Action Recommendation

Based upon the analytical data for surface soil, no contamination associated with IHSS 203 could be identified. IHSS 203 was approved for NFA in a letter from the CDPHE and EPA (the LRA) dated July 9, 1999 (EPA and CDPHE 1999).

Comments

IHSS 203 is within the Present Landfill (IHSS 114).

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1998), July 9.

DOE, 1991, Final Phase I RFI/RI Work Plan Rocky Flats Plant, Present Landfill IHSS 114 and Inactive Hazardous Waste Storage Area IHSS 203 (Operable Unit No. 7), Rocky Flats Plants, Golden, Colorado, August.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Final Work Plan Technical Memorandum for OU 7, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996b, OU 7 Revised Draft Interim Measures/Interim Remedial Action (IM/IRA) Decision Document and Closure Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: NW-1500

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Diesel Spill at PU&D Yard

The Final Update to the HRR for PAC NW-1500 consolidates the information presented in the Third and Seventh Quarterly Updates as well as the 1998 Annual Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC NW-1500 is summarized in this update. The following HRR volumes contain PAC NW-1500 information:

Original Report – Third Quarterly (DOE 1993);
Update Report – Seventh Quarterly (DOE 1994);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

December 17, 1992

Historical Summary

Approximately 1 1/2 gallons of diesel fuel spilled onto the ground within the southeast corner of the PU&D storage yard during a routine, forklift truck fueling operation when a fuel nozzle failed to shut off automatically after the tank reached capacity (DOE 1993). The location of the spill is within the PAC NW-170 boundary (PU&D Storage Yard) as shown on Figure 10.

The soil affected by the spill was excavated and containerized. Samples of the excavated material were collected for waste dispositioning purposes. The area affected by the spill was surveyed using Global Positioning System (GPS) on March 15, 1993 (DOE 1993).

PAC Investigations

Contaminants detected in the groundwater (that is, tetrachloroethene, 1,1,1-trichloroethane, and trichlorotrifluoroethane) are not components of diesel fuel (DOE 1998). Additionally, because the affected soil was removed, additional sampling was not required.

No Further Action Recommendation

Based on the subsurface soil sampling data (RMRS 1997a, 1997b), an existing or residual source of contamination associated with PAC NW-1500 could not be identified. PAC NW-1500 was approved for NFA in a letter from CDPHE and EPA (the LRA) dated July 9, 1999 (CDPHE and EPA 1999). The NFA was justified because the spill was cleaned up and did not adversely impact soil or water.

Comments

PAC NW-1500 is within IHSS NW-170.

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1998), July 9.

DOE, 1993, Third Quarterly Update from January 1, 1993 to April 1, 1993 Historical Release Report, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994, Seventh Quarterly Update from January 1, 1994 to March 31, 1994 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

RMRS, 1997a, Final Sampling and Analysis Plan for the Pre-Remedial Investigation of IHSSs 170, 174a and 174b, Property Utilization & Storage Yard, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

RMRS, 1997b, Data Summary Report for IHSSs 170, 174a, and 174b, Property Utilization and Storage Yard, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NW-1501

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Asbestos Insulated Boiler at the PU&D Yard

The Final Update to the HRR for PAC NW-1501 consolidates the information presented in the Third and Seventh Quarterly Updates as well as the 1999 Annual Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC NW-1501 is summarized in this update. The following HRR volumes contain PAC NW-1501 information:

Original Report – Third Quarterly (DOE 1993);
Update Report – Seventh Quarterly (DOE 1994);
Update Report – 1999 Annual (DOE 1999a); and
Update Report – 2000 Annual (DOE 2000).

Date(s) of Operation or Occurrence

November 12, 1992

Historical Summary

On November 12, 1992, it was discovered that approximately 1.5 lb of asbestos was potentially released to the environment from a boiler wrapped with deteriorating asbestos insulation. The boiler was being stored in the southwestern corner of the PU&D Yard (PAC NW-170) (DOE 1993), shown on Figure 10. Visual observations made on November 12, 1992, indicated approximately 15 ft² of asbestos-containing insulation was missing. There was no visible insulation material identified on the ground (DOE 1993).

Upon discovery, the boiler was wet down and the surrounding soil was covered with plastic. The boiler was wrapped with plastic, taped, and removed (DOE 1993).

PAC Investigations

A SAP for characterization sampling was prepared by a State Certified Asbestos Inspector (DOE 1999b). Ten composite surface soil samples (nine real and one duplicate) were collected on January 24, 1999 (DOE 1999a; DOE 1999b). None of the soil samples contained detectable levels of chrysotile asbestos. A detailed figure of PAC NW-1501 is found in the 1999 Annual Update to the HRR.

No Further Action Recommendation

- Based on the results of the soil samples collected in 1999 (DOE 1999a; DOE 1999b), no current or potential contaminant source was identified. The containment and removal of the asbestos-containing boiler in 1992 and the results of the source evaluation provide sufficient justification to determine there was no current or potential threat to public health or the

environment. It is suspected the boiler may have been placed in the storage yard with the asbestos material already missing and a release did not occur at this location.

- PAC NW-1501 was approved for NFA in a letter from CDPHE and EPA dated June 23, 2000. The NFA was justified because no source of contamination could be identified and the potential release of asbestos did not adversely impact soil or water.

Comments

PAC NW-1501 is within the PU&D Yard (PAC NW-170).

References

CDPHE and EPA, 2000, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1999), June 23.

DOE, 1993, Third Quarterly Report to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994, Seventh Quarterly Update from January 1, 1994 to March 31, 1994 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, No Further Action Justification Document for the Property Utilization and Disposal Yard Asbestos Site, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

RMRS, 1999, Asbestos Sampling and Analysis Plan for the Property Utilization and Disposal Yard Boiler Site, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

PAC REFERENCE NUMBER: NW-1502

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Improper Disposal of Diesel Contaminated Material at the Landfill

The Final Update to the HRR for PAC NW-1502 consolidates the information presented in the Second, Third and Seventh Quarterly Updates to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC NW-1502 is summarized in this update. The following HRR volumes contain PAC NW-1502 information:

Original Report – Second Quarterly (DOE 1993a);
Update Report – Third Quarterly (DOE 1993b);
Update Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 25, 1992

Historical Summary

On September 25, 1992, a report was made of improper disposal of diesel-contaminated soil and absorbent material to the Present Landfill (PAC NW-114). The material was generated from cleanup of approximately 1 gallon of diesel fuel released onto the asphalt while patching the Building 850 Parking Lot. The diesel was absorbed with approximately 50 lb of soil and Oil-Dri absorbent and inadvertently taken to the landfill. In accordance with Plant procedure, diesel spills and associated cleanup materials were managed as a potential RCRA waste because of benzene (DOE 1993a). The location of PAC NW-1502 is shown on Figure 10.

CDPHE was notified and a RCRA Contingency Plan (CPIR 92-021) implemented as a precautionary measure. Approximately 100 lb of potentially contaminated soil was removed from the area (within the landfill) and dispositioned in accordance with Plant procedure for fuel-contaminated soils (DOE 1993a). No samples were collected as a result of this occurrence (CPIR 92-021).

PAC Investigations

No other PAC NW-1502 investigations were deemed necessary because the soil was removed.

No Further Action Recommendation

PAC NW-1502 was addressed using the consultative process in an NFA Working Group meeting on December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified because the material placed in the landfill was removed and dispositioned properly. Further, the diesel-contaminated soil did not likely adversely impact soil or water.

The NFA was formally approved in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Approval of NFA designation for IHSSs and PACs, February 14.

DOE, 1993a, Second Quarterly Report to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1993b, Third Quarterly Report to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994, Seventh Quarterly Update from January 1, 1994 to March 31, 1994 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NW-1503

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Improper Disposal of Fuel Contaminated Material at the Landfill

The Final Update to the HRR for PAC NW-1503 consolidates the information presented in the First and Seventh Quarterly Updates to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC-NW-1503 is summarized in this update. The following HRR volumes contain PAC NW-1503 information:

Original Report – First Quarterly (DOE 1992);
Update Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

February 26, 1992

Historical Summary

On February 26, 1992, empty motor oil containers, used oil filters and oil-stained debris were inadvertently disposed of in a centralized area of the Present Landfill (PAC NW-114), shown on Figure 10. The used oil filters were determined to be regulated as a RCRA hazardous waste because of the potential for containing lead in excess of the TCLP limit of 5 ppm (DOE 1994). These materials were immediately recovered and drummed by landfill personnel and a RCRA Contingency Plan (CPIR 92-004) was implemented. As a result of the prompt recovery of the disposed items, it was determined no actual or potential threat to the environment or human health was posed (DOE 1994). No samples were collected as a result of this occurrence because a release to the environment did not occur (CPIR 92-021).

PAC Investigations

No other PAC NW-1503 investigations were deemed necessary because the soil was removed.

No Further Action Recommendation

PAC NW-1503 was addressed using the consultative process in an NFA Working Group meeting on December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified because the material placed in the landfill was sufficiently removed before a release to the environment could take place. This occurrence did not adversely impact soil or water. PAC NW-1503 was approved for NFA in a letter from CDPHE and EPA (the LRA) dated February 14, 2002 (CDPHE and EPA 2002).

Comments

The CPIR dated September 30, 1992 is all that was available for the First Quarterly Report to the HRR, therefore, no formal PAC narrative was written until 1994 for this occurrence.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Approval of NFA designation for IHSSs and PACs, February 14.

DOE, 1992, First Quarterly Report to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, September.

DOE, 1994, Seventh Quarterly Update from January 1, 1994 to March 31, 1994 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NW-1504

IHSS Number:	Not Applicable
Current Operable Unit:	BZ
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Improper Disposal of Thorosilane-Contaminated Material at the Landfill

The Final Update to the HRR for PAC NW-1504 consolidates the information presented in the Seventh Quarterly Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC NW-1504 is summarized in this update. The following HRR volumes contain PAC NW-1504 information:

Original Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

January 28, 1994

Historical Summary

On January 28, 1994, materials potentially contaminated with Thorosilane (Thorosilane consists of mineral spirits, naphtha and diacetone alcohol) were disposed of in a centralized area of the Present Landfill (PAC NW-114), shown on Figure 10. When disposed of in liquid form, Thorosilane is considered a hazardous waste exhibiting the characteristic of ignitibility (D001). The incident occurred as a result of a January 27, 1994 spill in Building 551 when a 5-gallon bucket containing approximately 5 gallons of Thorosilane product leaked into the double bags surrounding the can.

The spilled material and the remainder in the bucket were placed into a 20-gallon poly-pack drum along with 75 lb of Oil-Dri. The contents were not agitated. The drum was then sealed and subsequently placed into the Present Landfill. Upon discovery, the RCRA Contingency Plan (CPIR 94-002) was implemented as a precautionary measure.

On February 1, 1994, the poly-pak was located in the landfill; however, the lids and approximately half of the contents were not found. It was presumed the hydraulic compaction system in the trash truck crushed both the overpack and metal bucket and lids from both containers. No free liquids were found. The crushed poly-pack and product bucket containing part of the Oil Dri were packaged in a 55-gallon drum and returned to the 551 Warehouse for proper handling and disposition. A determination was made that the drummed material no longer constituted a hazardous waste. The CPIR indicated the incident had not contributed to any measurable deterioration to the landfill condition.

PAC Investigations

No other PAC NW-1504 investigations were deemed necessary because the spilled material was removed and did not impact soil.

No Further Action Recommendation

PAC NW-1504 was addressed using the consultative process in an NFA Working Group meeting on January 31, 2002. Based on these discussions, agreement was reached that an NFA was justified because the material placed in the landfill was sufficiently removed and did not likely adversely impact soil or water. NW-1504 was approved for NFA in a letter from CDPHE and EPA (the LRA) dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Approval of NFA designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, Seventh Quarterly Update from January 1, 1994 to March 31, 1994 Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: NW-1505

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: NE-1
Unit Name: North Firing Range

The Final Update to the HRR for PAC NW-1505 consolidates the information presented in the 2001 Annual Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC-1505 is summarized in this update. The following HRR volumes contain PAC NW-1505 information:

Original Report – 2001 Annual (DOE 2001).

Date(s) of Operation or Occurrence

1983 to 2004

Historical Summary

A firing range (Buildings 303 and 308) located in the Northwest BZ was in use for target practice and security officer qualification from 1983 until 2004. The location of PAC NW-1505 is shown on Figure 10. The range consisted of a concrete pad covered by a roof. Until 1993, the target area consisted of a bermed area (approximately 300 ft by 200 ft). In December 1993, construction began to enhance the range with an improved backstop (bullet trap) and roof (DOE 2001). Potential lead contamination may have resulted from bullets fired into the north berm within the firing range. Brass bullet casings were collected, containerized, and sent to PU&D for recycling since the range went into use. Several times a year, bullets and lead fragments (collected in the bullet trap) were containerized in 3-gallon plastic buckets and transferred to PU&D for recycling.

Use of solvents for cleaning firearms did not occur at this location, nor have any explosives been detonated or armor piercing ammunition been used. The concrete pad was washed with approximately 200 to 300 gallons of water several times a year. The rinse water would flow into a culvert on the eastern side of the pad and was blocked with sediment and vegetation for an undetermined length of time (DOE 2001).

PAC Investigations

In accordance with IABZSAP Addendum #IABZ-05-01 (DOE 2004) for characterization of the North Firing Range (IHSS Group NE-1), 61 soil characterization samples were collected and analyzed for total metals. Three sampling locations required a RFCA accelerated action (DOE et al. 1996) because of exceedances of lead ALs (DOE et al. 2003) as described in the IHSS Group NE-1 Closeout Report (DOE 2005a). Approximately 32 cy of soil and a culvert (under the berm) were excavated and disposed of in accordance with the ER RSOP FY05 Notification #05-05 (DOE 2005b).

Through the consultative process, it was agreed that remediation for arsenic concentrations greater than the RFCA WRW soil AL (when using on-site, x-ray fluorescence [XRF]) would not be warranted because the XRF provides results higher than mass spectroscopy methods. After remediation, both lead and arsenic concentrations were less than WRW ALs (DOE 2005a).

Through the consultative process (RCR dated August 11, 2005), it was agreed that DOE would push in the North Firing Range berms and regrade the site. The berms were pushed in, and the surface was inspected for bullets and fragments. Soil samples were collected from the surface and analyzed using XRF. The maximum detected concentration of copper was 19.7 mg/kg and the maximum detected concentration of lead was 51.6 mg/kg. This action was completed on August 29, 2005.

No Further Action Recommendation

PAC NW-1505 was remediated in spring of 2005 and approved for NFAA in a letter from EPA (the LRA) dated June 13, 2005 (EPA 2005).

Comments

The North Firing Range is also described as Site #11 in the BZ Contamination Review (CDPHE 1999).

References

CDPHE, 1999, Buffer Zone Contamination Review, Hazardous Materials and Waste Management Division, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Industrial Area and Buffer Zone Sampling and Analysis Plan Addendum #IABZ-05-01, PAC NW-1505 (North Firing Range), Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2005a, Closeout Report for IHSS Group NE-1, North Firing Range, PAC NW-1505, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005b, Environmental Restoration RFCA Standard Operating Protocol, FY05 Notification #05-05, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.









DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

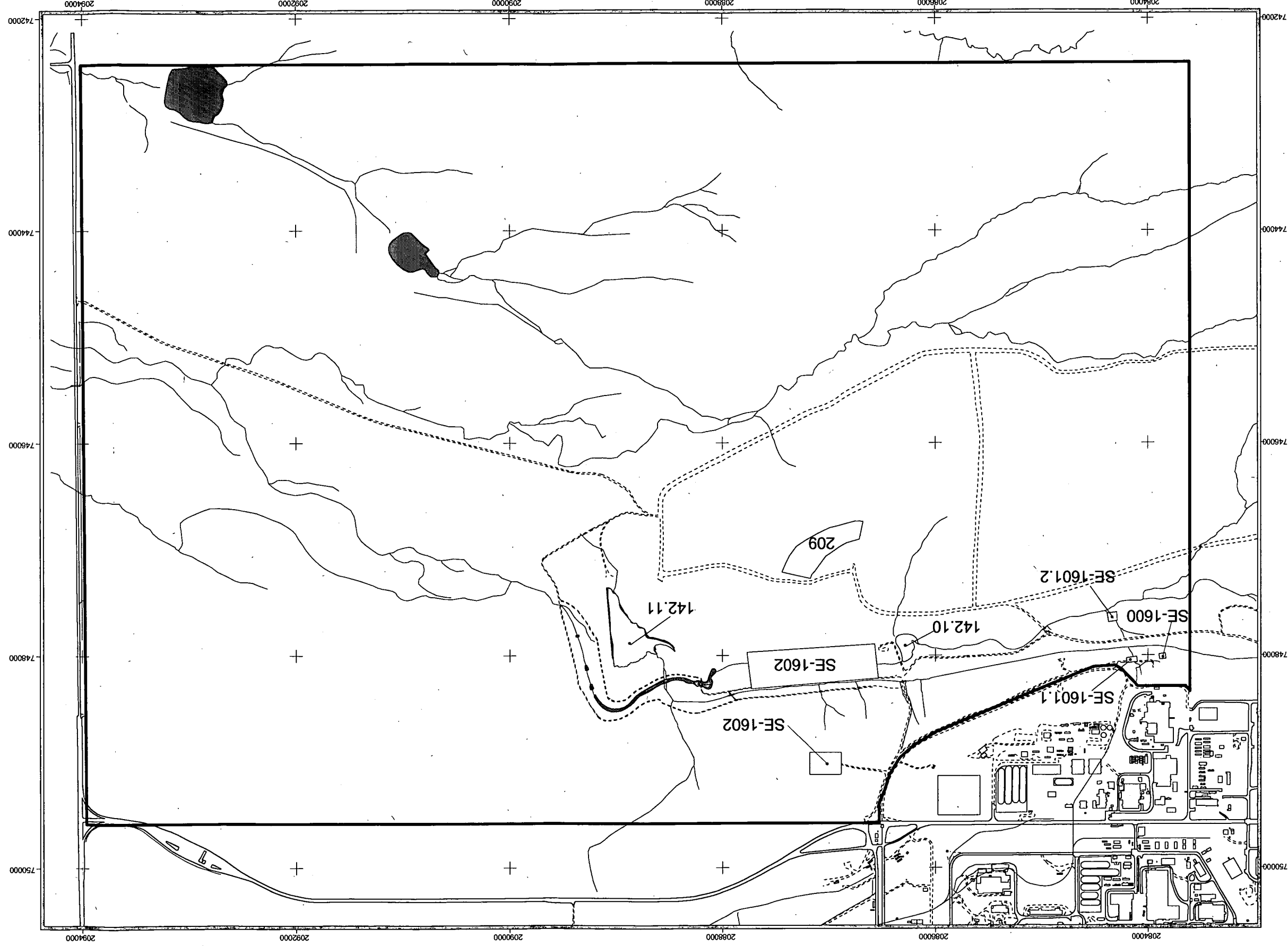
EPA, 2005, Correspondence to J. Rampe, DOE, RFPO from C.M. Aguilar, EPA, RE: Closeout Report for IHSS Group NE-1, North Firing Range, June 13.

SE Area

Figure 11
Southeast Buffer Zone Area
IHSSs and PACs

KEY

-  Streams
-  Dirt roads
-  PAC
-  IHSS
-  HRR area
-  Lakes
-  Asphalt
-  Building



Scale = 1: 13825
 State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27
 750 Feet



U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.27.05



PAC REFERENCE NUMBER: SE-142.10

IHSS Number: 142.10
Current Operable Unit: BZ
Former Operable Unit: 5
IHSS Group: NE-1
Unit Name: Retention Pond C-1

The Final Update to the HRR for PAC SE-142.10 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 142.10 is summarized in this update. The following HRR volumes contain IHSS 142.10 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997a); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1955 to present

Historical Summary

Pond C-1, IHSS 142.10 at RFETS, was constructed in 1955 to provide temporary holding and monitoring of Woman Creek waters. The first discharge from Pond C-1 was observed on March 29, 1955. The location of IHSS 142.10 is shown on Figure 11.

Pond C-1 was also referred to as Pond 9 prior to the early 1970s and received discharge from upstream Ponds 6, 7, and 8. Ponds 7 and 8 (PACs SE-1600 and SE-1601) were approved for NFAA in 2002. Ponds 6, 7, and 8 no longer exist and never received an alphanumeric designation like Pond 9, which became Pond C-1. The numeric pond numbering system at RFETS was replaced by an alphanumeric system in the early 1970s.

Ponds 6, 7, and 8 were located adjacent to Woman Creek upstream from Pond C-1. Pond 6 (PAC SW-196) received the raw water treatment plant, Building 124, backwash. Pond 7 (PAC SE-1600) received steam condensate from the Building 881 cooling towers and could have received sewage lift station overflows. Pond 8 (PAC SE-1601) probably received Building 881 cooling tower overflow/blowdown. See the descriptions for PACs SW-196, SE-1600, SE-1601.1, and SE-1601.2 for more complete discussions of these ponds.

Woman Creek flow enters Pond C-1, which serves as a flow-through temporary detention pond. The South Interceptor Ditch (SID) was constructed in 1979 to reroute runoff from the southern portions of the RFETS main manufacturing area to Pond C-2 (IHSS 142.11). Discharges from Pond C-1 are routed around Pond C-2 and back into the natural Woman Creek channel. Water from the SID is the only input to Pond C-2, and Pond C-2 serves as a surface water retention and spill control pond (DOE 1992).

Releases or concerns associated with Woman Creek, as summarized in the HRR (DOE 1992), are as follows:

- Sanitary sewer overflow and discharge of untreated sanitary sewage were released to Woman Creek. Discharges ceased on February 21, 1955.
- A release of 2,700 gallons of steam condensate from Building 881 to Pond 7 occurred because of a break in the process waste line leading to Building 774. The break occurred on September 27, 1955.
- Pond C-1, its drainage, and the general area near Pond C-1 (and Pond C-2) may have been impacted by resuspended soil and runoff from the 903 Pad area (PACs 900-112 and 900-155).
- An armored vehicle turned over into Woman Creek upstream of Pond C-1 on October 19, 1975 (PAC SW-1700). An oil slick was observed on the C-Series Drainage west of the clay pits during the week of October 20, 1975. This oil slick was not observed at Pond C-1 or where the C-Series Drainage passed beneath Indiana Street.

Monitoring of effluent discharged off site from the Woman Creek drainage has routinely taken place since the first discharge from Pond C-1. In 1955, these analyses consisted of daily composite samples for pH, nitrate, and radionuclide activity, with a detailed mineral analysis on a monthly composite. More recently, the analytes that have been routinely used to monitor, via surface water monitoring stations, off-site discharges from the C-Series Drainage have consisted of pH, nitrate as nitrogen, radionuclides, and nonvolatile suspended solids.

IHSS Investigations

As documented in the RFI/RI for the Woman Creek Priority Drainage, OU 5 (DOE 1996), IHSSs 142.10, and 142.11, along with the SID and Woman Creek Source Area, were grouped as AOC 3 for purposes of the HHRA. The results of the HHRA for AOC 3 showed that for all current and future on-site receptors, the cumulative HIs for noncarcinogenic health effects are 0.001 or less. Therefore, no adverse noncancer health effects are expected under the exposure conditions evaluated. For all current and future on-site receptors, the excess lifetime cancer risk was estimated to be 6×10^{-8} or less, thus indicating negligible risk. Land use scenario/receptor assumptions for the assessment included current worker (security worker), future construction worker, future ecological researcher, future office worker, and future open space worker (DOE 1996).

According to the risk assessment completed as part of the OU 5 Phase I RFI/RI, the greatest total estimated risk was for the future office worker in AOC 1, and was 3×10^{-5} . However, it is unlikely that an office building would be built on a landfill. Total annual radiation doses for all receptors in all AOCs were less than 1, which fell below the DOE limit of 100 millirems per year (mrem/yr) for members of the public and indicated exposure to radionuclides in OU 5 was negligible (DOE 1996).

Sediment samples were analyzed for metals, radionuclides, VOCs, SVOCs, pesticides, PCBs, and water quality parameters (WQPs) (DOE 1997b). Surface water samples were analyzed for all analytical suites except PCBs. Although PCBs were not analyzed for in surface water, they are relatively insoluble. Surface water was sampled frequently between 1991 and 1996 for total radionuclides. In 1991, several samples were collected for dissolved radionuclides and total and dissolved metals, as well as organics. Surface water sampling and analysis at Pond C-1 ceased after 1996 in accordance with the Integrated Monitoring Plan (IMP) (DOE 1997b).

In accordance with RFCA (DOE et al 1996), surface water compliance monitoring is conducted at several locations on Site, including where Woman Creek crosses Indiana Street. Pond C-1 is a flow-through retention basin and, if there is adequate flow, the water ultimately discharges off the Site in Woman Creek at Indiana Street (compliance monitoring station GS01) (Plate 4). Flow in Woman Creek at Indiana Street is likely a mixture of Pond C-1 outflow and runoff from within the Woman Creek drainage downstream of Pond C-1. At GS01, plutonium and americium concentrations have been monitored since October 1996, total uranium concentrations since February 2003, and tritium concentrations from October 1996 through June 2003. (As of June 2003, tritium is no longer an analyte of interest [AOI]) (DOE 2004). The monitoring data (DOE 2000, 2001, 2002) indicate AOI concentrations are less than the RFCA Attachment 5, Table 1, surface water ALs and standards (surface water ALs) (DOE et al. 2003; DOE 1997b).

Application of the Subsurface Soil Risk Screen

Current site conditions are evaluated by using the SSRS to determine whether remediation is required. The SSRS follows the steps identified on Figure 3 of Attachment 5 of RFCA (DOE et al. 2003). The SSRS for Pond C-1 was completed as part of the NFAA recommendation process.

Screen 1 – Are COC concentrations below RFCA Attachment 5 Table 3 WRW Soil ALs?

Yes. Subsurface soil concentrations are less than the WRW soil ALs. In accordance with Figure 3 of RFCA Attachment 5, Screen 4 is performed next given a “yes” response to Screen 1 (DOE 2004).

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause exceedance of surface water standards?

No. Pond C-1 is a flow-through pond on Woman Creek and, therefore, erosion is a potentially significant pathway whereby surface water could become contaminated by the sediments. However, concentrations of contaminants above background in the sediment are relatively low. The few organic compounds that were detected at low levels in the sediment have never been detected in Pond C-1 surface water.

Plutonium-239/240, americium-241, and uranium-total concentrations have been greater than background in Pond C-1 surface water samples, and occasionally greater than the surface water ALs. However, concentrations greater than the surface water ALs were very infrequent. The data indicate most of the radionuclide concentrations are less than or only slightly greater than background levels.

No Further Action Recommendation

Sediment COC concentrations are well below the RFCA Attachment 5 Table 3, WRW soil ALs (DOE et al. 2003) and the monitoring data for GS01 on Woman Creek at Indiana Street indicate there have never been AOIs at concentrations above the surface water ALs. Therefore, it was concluded an NFAA is justified at IHSS 142.10.

After review of the NFAA justification by the regulatory agencies, DOE received concurrence from EPA (the LRA) of the NFAA status for Pond C-1 (PAC Reference Number SE-142.10) on June 17, 2004 (EPA 2004).

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Integrated Monitoring Plan Background Document, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, RFETS Automated Surface-Water Monitoring Report: Water Years 1997-2000, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2001, RFETS Automated Surface-Water Monitoring Report: Water Year 2001, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2002, RFETS Automated Surface-Water Monitoring Report: Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2004, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996b, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2004, Correspondence to J. Legare, DOE RFFO, from M. Aguilar, EPA, RE: No Further Accelerated Action Justification for Retention Pond C-1 (PAC Reference Number SE-142.10, June 17.

PAC REFERENCE NUMBER: SE-142.11

IHSS Number: 142.11
Current Operable Unit: BZ
Former Operable Unit: 5
IHSS Group: NE-1
Unit Name: Retention Pond C-2

The Final Update to the HRR for PAC SE-142.11 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 142.11 is summarized in this update. The following HRR volumes contain IHSS 142.11 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1997 Annual (DOE 1997).

Date(s) of Operation or Occurrence

1979 to present

Historical Summary

Pond C-2, IHSS 142.11 at RFETS, was constructed in 1979 and is downgradient of Pond C-1 and the SID. Figure 11 illustrates IHSS 142.11's location at the Site.

The SID was constructed in 1979 to reroute runoff from the southern portions of the RFETS IA to Pond C-2. Besides much localized drainage from precipitation, water from the SID is the only input to Pond C-2; Pond C-2 serves as a surface water retention and spill control pond. Woman Creek flow enters Pond C-1, PAC SE-142.10, which serves as a flow-through temporary detention pond. Discharges from Pond C-1 are routed around Pond C-2 and back into the natural Woman Creek channel (DOE 1992a, 1997). Releases or concerns that are known to have been associated with the C-Series Drainage are summarized and listed below (DOE 1992a, 1997):

- Pond C-1, the C-Series Drainage, and the general area near Pond C-1 and Pond C-2 are believed to have been impacted by resuspended soil and runoff from the 903 Pad area (PACs 900-112 and 900-155).
- Leaks from the SID to Woman Creek near the outfall of the Building 881 footing drain were observed during the week ending March 12, 1982. Repairs to the SID were requested.
- Direct runoff from the East Spray Field (PACs NE-216.1, NE-216.2, and NE-216.3) to Woman Creek was observed on March 2, 1987.
- A spill of waste acid may have impacted the SID and Pond C-2 on April 10, 1989. Based on the RCRA CPIR generated for the April 10, 1989, waste acid spill, 5 to 7 gallons of a dilute nitric acid and nitrad, a combination of hydrofluoric acid and ammonium salts, waste solution entered a storm drain that eventually drains to Pond C-2 (via the SID). A more complete discussion of the activities surrounding this event can be found in PAC 400-205 (DOE 1992a).
- Measurable quantities of atrazine were identified in Pond C-2 in 1989.

The identification of atrazine in Pond C-2 resulted in the construction of modular activated carbon treatment system at Pond A-4, Pond B-5, and Pond C-2. These systems were only in operation for a short period of time before being dismantled.

IHSS Investigations

In accordance with the OUS Phase I RFI/RI Work Plan (DOE 1992b), three surface sediment samples were collected in Pond C-2 as part of the OU 5 RFI/RI. Two samples were analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs and one was analyzed for radionuclides, metals, and VOCs. An additional sample, collected as part of a sitewide sampling program, was analyzed for PCBs and pesticides. IHSSs 142.11 along with the SID and Woman Creek Source Area, were grouped as AOC 3 for purposes of the OU 5 HHRA. The results of the HHRA for AOC 3 showed that for all current and future on-site receptors, the cumulative HIs for noncarcinogenic health effects are 0.001 or less. Therefore, no adverse noncancer health effects are expected. For all current and future on-site receptors, the excess lifetime cancer risk was estimated at 6×10^{-8} or less, thus indicating negligible risk (DOE 1996). Land use scenario/receptor assumptions for the assessment included current worker (security worker), future construction worker, future ecological researcher, future office worker, and future open space worker (DOE 1996). The human health estimates supported the recommendation for NFA and are consistent with the criteria for recommending NFA decisions presented in RFCA (DOE 1996b). The results of the ERA did not indicate a substantial and definitive risk to ecologic receptors.

At Pond C-2, six surface sediment and two subsurface sediment samples were collected and analyzed for radionuclides and metals in accordance with IABZSAP Addendum #IABZ-05-06 (DOE 2005a).

Results from all investigations were evaluated and presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005b). PCBs were not detected in either surface or subsurface sediment. Americium-241 was detected at activities ranging from 0.394 to 0.727 pCi/g in surface sediment, and at an activity of 0.305 pCi/g in subsurface sediment. Plutonium-239/240 was detected in surface soil at activities ranging from 2.09 to 2.96 pCi/g. In subsurface sediment, plutonium-239/240 was detected once at an activity of 1.64 pCi/g. Several metals were detected in surface sediment at concentrations only slightly greater than background mean plus two standard deviations. All concentrations and activities were less than WRW soil ALs (DOE et al. 2003).

The Ecological Screen indicated mercury, zinc, and total PAHs required additional evaluation. The surface sediment ESL HQs for these analytes were less than 10 indicating low risk. Concentrations of zinc occur within background ranges. Previous studies indicated that aquatic life within Pond C-2 is typical of pond systems within the region and there has not been a measurable impact on Pond C-2 aquatic ecology attributable to a chemical stressor. Results of the Ecological Screen indicated these analytes have a low risk to aquatic populations in Pond C-2 (DOE 2005b).

No Further Action Recommendation

Based on analytical results, the SSRS, and the ecological screen, accelerated action is not required and an NFAA determination is justified for IHSS Group NE-1 given the following:

- Activities and concentrations of COCs were uniformly below RFCA WRW soil ALs.
- Migration of soil or sediment contaminants to surface water is unlikely to impact water quality because little contamination is present. Routine surface water monitoring results indicate surface water standards are met and that pond sediments are not impacting surface water. The ponds are also configured to protect off-site water sources. Stormwater runoff is retained in the Terminal Ponds, sampled, and if the surface water results meet applicable standards, the water is released. Erosion of the pond sediments because of a large influx of water (from a storm) is not likely because the ponds are currently and expected to remain as low-energy ponds and less water will be available after Site closure. Additionally, predictions of contaminant migration based on the integration of the WEPP (USDA 1995) and HEC-6T (Thomas 1999) models are conservative. Site empirical data indicate contaminant migration is less than model predictions.
- Contaminants originating in IHSS Group NE-1 soil and sediment are not likely to impact surface water via transport in groundwater because soil contamination levels in IHSS Group NE-1 are very low. Groundwater contamination present beneath IHSS Group NE-1 was evaluated as part of the Groundwater IM/IRA (DOE 2005c).
- Based on the ecological screen for the Ponds, removal of sediment to protect ecological receptors is not necessary.

The NFAA recommendation for Pond C-2 (IHSS 142.11), presented in the Data Summary Report for IHSS Group NE-1 (DOE 2005b), was approved by EPA (the LRA) on ____.

Comments

None

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 5 Woman Creek Priority Drainage, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Final Comprehensive Risk Assessment Work Plan and Methodology, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Industrial Area and Buffer Zone Sampling and Analysis Plan Addendum #IABZ-05-06, Rocky Flats Environmental Technology Site Golden, Colorado, July.

DOE, 2005b, Data Summary Report for IHSS Group NE-1, Rocky Flats Environmental Technology Site Golden, Colorado, (in prep)

DOE, 2005c, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA (approval letter) in prep

Thomas, W.A., 1999, Sedimentation in Stream Networks (HEC-6T). Mobile Boundary Hydraulics, Clinton, Mississippi.

USDA, 1995, Water Erosion Prediction Project Hillslope Profile and Watershed Model Documentation, NERSL Report No. 10. D.C. Flanigan, M.A. Nearing, and J.M. Laflin, eds, USDA-ARS National Soil Erosion Research Laboratory, West Lafayette, Indiana.

PAC REFERENCE NUMBER: SE-209

IHSS Number: 209
Current Operable Unit: BZ
Former Operable Unit: 5
IHSS Group: Not Applicable
Unit Name: Surface Disturbance Southeast of Building 881

The Final Update to the HRR for PAC SE-209 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 209 is summarized in this update. The following HRR volumes contain IHSS 209 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1955

Historical Summary

This area consisted of a surface disturbance at the site of a former borrow pit. Gravel taken from the pit was used for Plant construction activities. Although waste disposal is not believed to have taken place at this location, DOE agreed to investigate the site as a possible waste disposal area (DOE 1992). Figure 11 illustrates IHSS 209's location at the Site.

IHSS Investigations

As documented in the Phase I RFI/RI Report for OU 5 (DOE 1996), IHSS 209 (PAC SE-209) and the source area west of the IHSS was removed from further evaluation in the HHRA because concentrations did not exceed the mean plus two standard deviations criterion established in the CDPHE screen. FIDLER surveys and surface water and soil samples were collected as part of the IHSS 209 portion of the OU 5 RFI/RI field investigation. The data suggested COCs exceeding background were not present within IHSS 209, with the possible exception of mercury in one surface soil sample. Additionally, results of the Phase I RFI/RI ERA for the Woman Creek Watershed did not indicate IHSS 209 was a source area (DOE 1996).

No Further Action Recommendation

Based upon the conclusions in the Phase I RFI/RI Report for OU 5, IHSS 209 was proposed for NFA in the 1997 Annual Update for the HRR (DOE 1997). This recommendation was consistent with the criteria for recommending NFA decisions presented in RFCA (DOE et al. 1996). The results of the HHRA and ERA supported the conclusions that any environmental contamination within OU 5, including IHSS 209, did not pose a significant threat to public health or the environment (DOE 1996).

After review of the NFA justification, DOE received approval from EPA (the LRA) and CDPHE of the NFA status for IHSS 209 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: SE-1600

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Pond 7 - Steam Condensate Releases

The Final Update to the HRR for PAC SE-1600 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC SE-1600 is summarized in this update. The following HRR volumes contain PAC SE-1600 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

March 1955 to before October 1964

Historical Summary

Pond 7, PAC SE-1600 at RFETS, was constructed in March 1955. Two other small ponds, Pond 6 and Pond 8-North (part of PAC SE-1601), and one large, unnamed pond were constructed in this area at approximately the same time. Figure 11 illustrates PAC SE-1600's location at the Site.

Pond 7 was constructed to serve as a retention pond and was located adjacent to the Woman Creek drainage, south of the Building 881 sewage lift station, which was also known as Building 887. There is no indication Pond 7 was hydraulically connected to or located in series with Pond 6 or Pond 8-North. On approximately September 27, 1955, steam condensate from Building 881 was released to Pond 7. The release was necessary because the condensate could not be sent to Building 774 because of a break in the process waste line leading to Building 774. Building 881 steam condensate was released to Pond 7 again on November 16, 1955, because of a frozen process waste line leading to Building 774. Each steam condensate release consisted of 2,700 gallons, and no documentation was found detailing the fate of the released steam condensate. However, it is suspected to have flowed out of Pond 7 and into the Woman Creek drainage (DOE 1992).

It is unclear when Pond 7 was abandoned; however, based on examination of aerial photographs, it appears that it was no longer active in October 1964. Additionally, a new pond (Pond 8-South) was constructed by October 1964 approximately 350 ft southeast of what is believed to have been the original Pond 8-North location. Based on aerial photograph reviews, Pond 8-South collected both flows that went to the old Ponds 7 and 8-North. Although there is no definitive information, Ponds 7 and 8-North were probably abandoned because of hillside instability (DOE 1992).

PAC Investigations

According to the original HRR (DOE 1992), it is believed that in 1971 some soil samples were collected in the immediate vicinity of Pond 7. However, no analytical results were found and it could not be determined whether the samples were collected. Additionally, pond samples collected during the 1987 RI activities were probably also collected at the Pond 7 location. Borehole locations in the vicinity of PAC SE-1600 were sampled and analyzed for radionuclides, metals, VOCs, SVOCs, PCBs, and pesticides in accordance with the Phase III RFI/RI Work Plan for OU1 (DOE 1991). Results indicated that radionuclides were either not detected or detected at activities very close to background. Americium-241 ranged from 0.0026 to 0.86 pCi/g, plutonium-239/240 was detected at a maximum of 0.0054 pCi/g, uranium-234 ranged from 0.02 to 0.87 pCi/g, uranium-235 was detected at 0.05 pCi/g, and uranium-238 was detected at a maximum of 1.24 pCi/g in surface soil. In subsurface soil, americium-241 ranged from 0.63 to 1.4 pCi/g, plutonium-239/240 ranged from 0.001 to 0.01 pCi/g, uranium-234 ranged from 0.01 to 0.96 pCi/g, uranium-235 was detected at a maximum of 0.04 pCi/g, and uranium-238 ranged from 0.01 to 1.02 pCi/g. Toluene was the only VOC that was detected at a maximum concentration of 270 µg/kg in subsurface soil (DOE 1994).

No Further Action Recommendation

PAC SE-1600 was part of a large group of IHSSs, PACs, and PICs that were given NFA status in 2002 by the FY2002 HRR Working Group (CDPHE and EPA 2002). The FY2002 HRR Working Group developed and implemented a systematic approach for reviewing NFA proposals in accordance with RFCA Attachment 6 and the Implementation Guidance Document (IGD) (DOE et al. 1996). After providing the exact location, existing sampling data, and information regarding whether the location was disturbed as part of OU 1, the NFA was granted (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPE Region VIII, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1991, Final Phase III RFI/RI Work Plan, 881 Hillside Area (Operable Unit No. 1) Department of Energy, Rocky Flats Plant, Golden, Colorado, March.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE 1994, Final Phase III RFI/RI, Rocky Flats Plant, 881 Hillside Area (Operable Unit 1) Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, August 1, 2001 through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBERS: SE-1601.1 AND SE-1601.2

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Pond 8 – Cooling Tower Discharge Releases PAC SE-1601.1
Pond 8-North – Original Pond 8 PAC SE-1601.1
Pond 8-South PAC SE-1601.2

The Final Update to the HRR for PAC SE-1601 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC SE-1601 is summarized in this update. The following HRR volumes contain PAC SE-1601 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

Pond 8 – North: March 1955 to before October 1964

Pond 8 – South: Before October 1964 to the mid-1970s

Historical Summary

Pond 8-North, PAC SE-1601 at RFETS, was constructed in March 1955. It was designed to serve as a retention pond for cooling tower water discharges, and was located south of the Building 881 dock area in the vicinity of the cooling tower condensate discharge pipe on the Woman Creek drainage (DOE 2002). Two other small ponds, Pond 6 and Pond 7 (PAC SE-1600), and one large, unnamed pond were constructed in this area at approximately the same time. The location of PAC SE-1601 is shown on Figure 11.

Based on aerial photographs, Pond 8-South replaced Pond 7 and Pond 8-North, which were no longer in use in October 1964. Pond 8-South collected flows that had previously gone to Pond 7, and Pond 8-North. Ponds 7 and 8-North were probably abandoned because of hillside instability. Pond 8-South was located on a gentler slope than Ponds 7 and 8-North (DOE 1992).

No documentation was found that identified Pond 8-North as the recipient of a release. However, its construction relative to the location of the cooling tower condensate discharge pipe makes a release probable. Interviewees indicated there was a constant, but small amount of overflow/blowdown from the Building 881 cooling towers in the past (DOE 1992). It is possible the Pond may also have received cooling tower discharges. Prior to the late 1970s, some Site cooling tower effluent contained chromium-based biocides. It appears that the pond also collected water from the Building 881 footing drain (DOE 2002).

PAC Investigations

No formal investigations into this area were documented (DOE 1992). Surface and subsurface samples were collected from two borehole sampling locations in the vicinity of PAC SE-1601.1

and analyzed for radionuclides, metals, VOCs, SVOCs, PCBs, and pesticides in accordance with the Phase III RFI/RI Work Plan for OU1 (DOE 1991). Results indicated that radionuclides were either not detected or detected at activities very close to background. Americium-241 ranged from 0.0026 to 0.86 pCi/g, plutonium-239/240 was detected at a maximum of 0.0054 pCi/g, uranium-234 ranged from 0.02 to 0.87 pCi/g, uranium-235 was detected at 0.05 pCi/g, and uranium-238 was detected at a maximum of 1.24 pCi/g in surface soil. In subsurface soil, americium-241 ranged from 0.63 to 1.4 pCi/g, plutonium-239/240 ranged from 0.001 to 0.01 pCi/g, uranium-234 ranged from 0.01 to 0.96 pCi/g, uranium-235 was detected at a maximum of 0.04 pCi/g, and uranium-238 ranged from 0.01 to 1.02 pCi/g. Toluene was the only VOC that was detected at a maximum concentration of 270 µg/kg in subsurface soil (DOE 1994).

Five borehole locations were sampled in the vicinity of PAC SE-1601.2 in accordance with the Phase III RFI/RI Work Plan for OU 1 (DOE 1991). Results indicated that americium-241, plutonium-239/240, and uranium-235 were not detected at activities greater than background, but uranium-234 was detected at 1.15 pCi/g and uranium-238 was detected at 1.88 pCi/g in surface soil. In subsurface soil, plutonium-239/240 was detected at 0.033 pCi/g, uranium-234 was detected at 2.92 pCi/g and uranium-238 was detected at 14.13 pCi/g. Americium-241 and uranium-235 were not detected at activities greater than background (DOE 1994).

No Further Action Recommendation

PACs SE-1601.1 and SE-1601.2 were part of a large group of IHSSs, PACs, and PICs that were given NFA status in 2002 by the FY 2002 HRR Working Group. After providing the exact location, existing sampling data, and whether the location was disturbed as part of OU 1, the NFA was approved by CDPHE and EPA (the LRA) on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPE Region VIII, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1991, Final Phase III RFI/RI Work Plan, 881 Hillside Area (Operable Unit No. 1) Department of Energy, Rocky Flats Plant, Golden, Colorado, March.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Final Phase III RFI/RI, Rocky Flats Plant, 881 Hillside Area (Operable Unit 1) Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, August 1, 2001 through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: SE-1602

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: 900-11
Unit Name: East Firing Range

The Final Update to the HRR for PAC SE-1602 consolidates the information in the 1999 HRR Annual Update. The disposition of PAC SE-1602, in accordance with the RFCA accelerated action process, is summarized in this update. The following HRR volume contains PAC SE-1602 information:

Annual Update – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1951 to 1986

Historical Summary

A firing range, located in the southeast BZ, was used for target practice and security officer firearm use qualification from 1951 through 1986. From 1951 through 1981, the hillside east of the range was used, and after 1981, the hillside south of Woman Creek was used as a target area. Figure 11 illustrates PAC SE-1602's location within the southeast BZ at the Site.

North Target Area

The north target area consisted of a firing range and berm (approximately 300 by 200 ft). Rounds were fired from the firing range east toward the berm. Bullets were found in the berm. Handgun and shotgun bullets of various calibers were used in this area (DOE 2005).

South Target Area

The south target area is located south of the firing range and on the hillside south of Woman Creek. Rounds were fired from the firing range south toward targets and into the hillside. Bullets have been found from the range to the road above the hillside and may also be present in the drainage. Handgun, shotgun, and rifle bullets of various calibers (up to 50 caliber), as well as depleted uranium (armor-piercing) bullets, were used in this area. However, depleted uranium armor-piercing bullets were not routinely used at the firing range (DOE 2005)

Lead from spent bullets was found in and near the Firing Range and north berm and southern hillside. Depleted uranium may be present in the south hillside. Brass bullet casings were collected, containerized, and sent to PU&D Yard for disposition (DOE 2005).

PAC SE-1602 was identified in the CDPHE BZ Contamination Report and officially designated a PAC in the 1999 Annual Update for the HRR (DOE 1999).

PAC Investigations

The East Firing Range and Target Area were investigated in accordance with BZSAP Addendum #BZ-04-11 (DOE 2004). WRW soil ALs (DOE et al. 2003) were exceeded in several locations. Characterization results indicated maximum metal concentrations in the berm area surface soil included antimony at 433 mg/kg, arsenic at 1,080 mg/kg, and lead at 143,000 mg/kg. WRW soil ALs were exceeded at two locations in the trench area: lead at a maximum concentration in surface soil of 4,500 mg/kg and 10,000 mg/kg in subsurface soil and lead and copper at a maximum concentrations of 100,000 mg/kg and 130,000 mg/kg, respectively, in surface soil. Analytical results for the North Target Area indicated that WRW soil ALs were not exceeded. The maximum concentration of lead in this area was 120 mg/kg and arsenic was not detected. Lead exceeded WRW soil ALs in the South Target Area with concentrations of 5,300 mg/kg.

As a results of the WRW soil AL exceedances accelerated action activities were described in ER RSOP Notification #03-11 (DOE 2003). Accelerated action activities included removal of contaminated soil and an asphalt parking lot. The COCs consisted of lead, arsenic, and antimony in the soil. Based on the consultative process, arsenic cleanup levels were set at 35 mg/kg while lead and antimony cleanup levels were set at their respective WRW soil ALs (RCR dated November 2, 2004). Soil with arsenic and lead concentrations greater than the established cleanup levels or ALs were remediated. After soil removal, maximum concentrations in the berm area included arsenic at 33.3 mg/kg, lead at 280 mg/kg, and antimony at 2.1 mg/kg in subsurface soil. Results indicated that the maximum chromium concentration in the trench area was 49 mg/kg and lead was 460 mg/kg. Residual maximum lead concentrations in subsurface soil in the South Target Area were 240 mg/kg. Based on consultation, no additional soil removal was required for these residual arsenic concentrations as described in the ER RCRs dated November 2, 2004 and November 11, 2004. Actions and analytical data are presented in the Closeout Report for IHSS Group 900-11, PAC SE-1602, East Firing Range and Target Area (DOE 2005).

No Further Action Recommendation

Soil with antimony, arsenic, copper, and lead concentrations greater than the WRW soil ALs, or in consultation with the regulatory agencies, was removed. The SSRS did not indicate further soil removal was necessary.

After regulatory agency review of the Closeout Report (DOE 2005), DOE received approval from EPA (the LRA) of the NFAA status for the East Firing Range and Target Area (PAC SE-1602) on February 8, 2005 (EPA 2005).

Comments

PAC SE-1602 includes BZ Contamination Report Site 1.

References

DOE, 1999, Annual Update for the Historical Release Report, August 1, 1998 through August 1, 1999, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Draft FY03 Notification #03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Buffer Zone Sampling and Analysis Plan FY04 Addendum #BZ-04-11, IHSS Group 900-11, PAC SE-1602 (East Firing Range), Rocky Flats Environmental Technology Site, Golden, Colorado, January.









DOE, 2005, Closeout Report for IHSS 900-11, PAC SE-1602, East Firing Range and Target Area, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

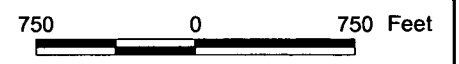
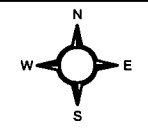
DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Legare, DOE RFPO; from M. Aguilar; EPA, RE: Closeout Report for IHSS Group 900-11, PAC SE-1602 East Firing Range and Target Area, February 8.

Figure 12
Southwest Buffer Zone Area
IHSSs and PACs

KEY

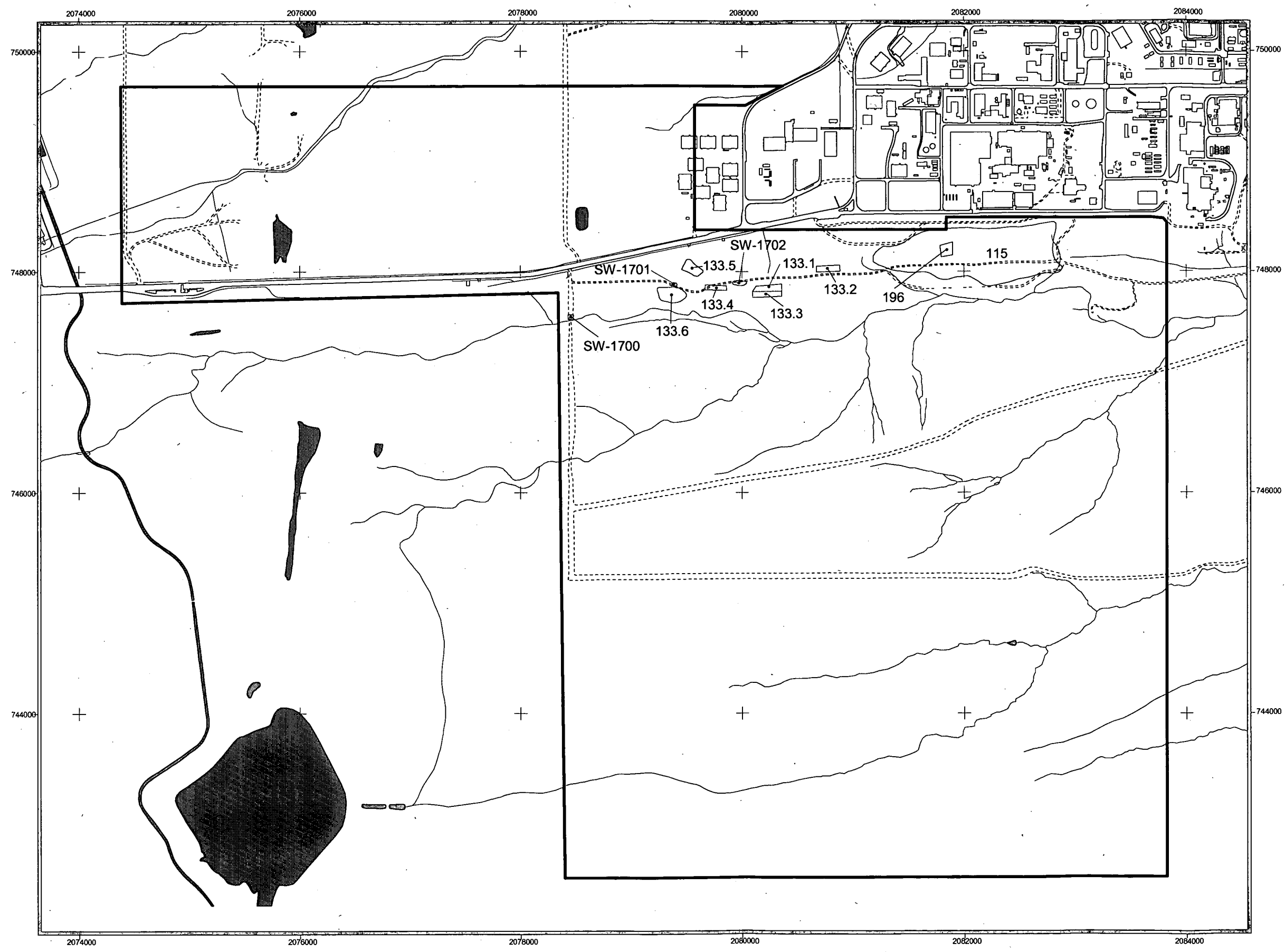
-  Streams
-  Dirt roads
-  PAC
-  IHSS
-  HRR area
-  Lakes
-  Asphalt
-  Building



Scale = 1: 12850
 State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.27.05



PAC REFERENCE NUMBER: SW-115

IHSS Number: 115
Current Operable Unit: IA
Former Operable Unit: 5
IHSS Group: SW-2
Unit Name: Original Landfill

The Final Update to the HRR for PAC SW-115 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 115 is summarized in this update. The following HRR volume contains IHSS 115 information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

1952 to 1968

Historical Summary

The Original Landfill (IHSS 115) was used to dispose of solid sanitary and construction debris wastes generated at Rocky Flats from 1952 to 1968. The Original Landfill was located south of the IA and north of Woman Creek. The landfill was not designed or operated as an engineered landfill. No liner or other collection barrier was installed between the waste and the existing surfaces (DOE 2005a). The location of IHSS 115 is shown on Figure 12.

Waste material was mixed with soil material during the waste placement process. The volume of disposed waste and commingled soil was estimated at 160,000 cy. Disposal operations at the Original Landfill ended by fall 1968 because of the Present Landfill (PAC NW-114, located north of the IA), which began operations on August 17, 1968 (DOE 1992). After disposal operations ceased, the waste material was covered with a layer of soil. However, details on the placement of the soil layer, including exactly when it was constructed, are not available (DOE 2005a). Because of the slope angle, and colluvial and weathered bedrock material making up the hillside, this area was identified as susceptible to sliding even before the slope was covered with waste fill (DOE 2005a).

Accurate and verifiable records of the waste placed in the landfill are not available. However, approximately 74,000 cy of sanitary waste and construction debris were disposed in the landfill (DOE 1996). These types of wastes likely included relatively small quantities of organics, paint and paint thinner, oil, pesticides, and cleaners (DOE 2005a). Commonly used organics from 1952 to 1968 may have included trichloroethene, carbon tetrachloride, tetrachloroethene, petroleum distillates, 1,1,1-trichloroethane, dichloromethane, and benzene (DOE 1996). In the 1960s, the landfill may have received PCB wastes (DOE 1992), such as carbonless copy paper, transformer and vacuum pump cleanup paper and rags, and small capacitors and fluorescent light bulbs. Metals such as beryllium and chromium, may also have been placed in the landfill (DOE 2005a).

The Original Landfill was used as a burn pit for the plant. Ash from the plant Incinerator (PACSW-133.5), graphite, used caustic drums, and general trash may have been dumped in the burn pit; however, no records of waste types have been found for at least the first decade of plant operation.

There is no information indicating that the Original Landfill was used for routine disposal of radioactive material or other hazardous substance waste streams. The majority of radioactive solid waste generated on site was disposed off site. Although the Original Landfill was not operated for management or disposal of radioactive waste, information in the HRR and characterization results indicate that some waste contaminated with radioactive material, most notably wastes from buildings where depleted uranium (DU) operations were conducted, were disposed in the Original Landfill. In addition, in 1965, 60 kg of DU were placed in the landfill. Efforts were later made to retrieve the DU, however, only 40 kg were recovered (DOE 1992).

Seepage emerging from the Original Landfill after a major rainstorm in July 1986 was traced to an outfall pipe from the Building 460 footing drains. Sloughing of material in the area of the outfall occurred as a result and hillside material may have washed into the South Interceptor Ditch (SID). To prevent migration of materials, a containment embankment was constructed to prevent flow into Woman Creek. The outfall piping was also extended to the east to discharge beyond the landfill boundary (DOE 1992, 2005a).

IHSS Investigations

IHSS 115 and 196 were part of OU 5, the Woman Creek Priority Drainage, which was consolidated into the IA OU when RFCA became effective in July 1996 (DOE et al. 1996). Prior to this consolidation, a Phase I RFI/RI for OU 5 was conducted in accordance with the RFI/RI Work Plan (DOE 1992b, 1994). IHSSs 115 and 196 were addressed in the OU 5 Phase I RFI/RI (DOE 1996), and for purposes of the investigation work, the OU 5 IHSSs (and PACs) were separated into specific AOCs. IHSSs 115 and 196 were designated as AOC 1 (DOE 1996).

Geotechnical investigations at the Original Landfill as part of the OU 5 Phase I RFI/RI indicated that the fill material encountered during the investigation consisted of waste mixed with varying amounts of sandy, clayey gravel and cobbles derived from colluvium and Rocky Flats Alluvium. The waste materials in the fill included sheet metal, wood, broken glass, plastic, rubber, metal shavings, graphite sand, solid blocks of graphite, concrete, asphalt, and portions of 55-gallon steel drums. The waste fill ranged in thickness from 2 ft to over 11 ft (DOE 2005a).

Soil samples were analyzed for metals, radionuclides, VOCs, SVOCs, pesticides, and PCBs. More than 7,500 validated analyses from 70 surface soil sample locations were collected in the IHSS 115 area. Radionuclide results indicated uranium-234, uranium-235, and uranium-238 were present in surface soil above the RFCA WRW soil ALs (DOE et al. 2003), at four locations: SS5055093, SS505293, SS505493, and SS515593. SS505093 had uranium-235 and uranium-238 WRW soil AL exceedances of 46 and 2,000 pCi/g, respectively; SS505293 had uranium-235 and uranium-238 WRW soil AL exceedances of 23 and 1,000 pCi/g, respectively; SS505493 had uranium-234, uranium-235 and uranium-238 WRW soil AL exceedances of 2,800, 670, and 38,000 pCi/g, respectively; and SS515593 had uranium-235 and uranium-238 WRW soil AL exceedances of 19 and 780 pCi/g, respectively. These four locations were removed during the "hot spot" removal portion of the accelerated action (DOE 2005a).

Organic results indicated that benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were present in surface soil above the RFCA WRW soil ALs, at 45,000, 43,000, and 49,000 µg/kg, respectively. More than 24,500 validated analyses from 175 subsurface soil sample locations were collected in the IHSS 115 area. Results indicated that benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene were present in the subsurface soil greater than the RFCA WRW soil ALs, at 48,000, 43,000, and 48,000 µg/kg, respectively (DOE 2005a).

The IHSS Group SW-2 (IHSSs 115 [Original Landfill] and 196) remedial action objectives (RAOs) were developed to (DOE 2005a):

- Prevent direct contact with landfill soil and commingled waste; and
- Control erosion caused by stormwater run-on and runoff.

The remedial action plan for the IHSS Group SW-2 consisted of the following major activities to meet RAOs:

- Removal of surface soil "hot spots";
- Grading of landfill to slope of 18 percent;
- Construction of a soil buttress;
- Placement of a 2-ft-thick soil cover over the entire waste area;
- Construction of surface water diversion berms and perimeter channels;
- Site monitoring (groundwater and surface water); and
- Institutional controls.

The objectives of this action were principally met through the removal of the surface soil that was contaminated above the WRW soil ALs. To achieve the remaining objectives, an engineered soil cover was designed to prevent direct contact with landfill soil and commingled waste and control erosion caused by stormwater runoff and runoff (DOE 2005a).

ER accelerated action activities at the Original Landfill were conducted between February 2005 and August 2005 (DOE 2005a; 2005b).

No Further Accelerated Action Recommendation

Closure of IHSS Group SW-2, including IHSS 115, was conducted in accordance with the Final IM/IRA for the Original Landfill (including IHSS Group SW-2; IHSS 115, Original Landfill and IHSS 196, Filter Backwash Pond) (DOE 2005a) and with the Final Design Report and Design Calculation Documentation for the Accelerated Action for the Original Landfill at the Rocky Flats Environmental Technology Site approved by CDPHE on May 13, 2005 (CDPHE 2005a) (DOE 2005b). Post-accelerated action monitoring and long-term surveillance and maintenance considerations were addressed in Appendix B of the Final IM/IRA for the Original Landfill (DOE 2005a). Three new monitoring wells were installed during the accelerated action (DOE 2005c).

Based on the completion of the Original Landfill cover and review of the subsequent Closeout Report and Construction, Completion, and Certification Report (DOE 2005c), NFAA status was approved by CDPHE (the LRA) for IHSS 115 on __ (CDPHE 2005b).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE, RFFO from S. Gunderson, CDPHE, RE: Original Landfill Design, May 13.

CDPHE, 2005b Approval Letter

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 5 Woman Creek Priority Drainage, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1994, Draft Final Technical Memorandum No. 15, Addendum to Final Phase I RFI/RI Work Plan, Amended Filed Sampling Plan, Volume 2, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Volume 1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2005a, Final Interim Measure/Interim Remedial Action for the Original Landfill (Including IHSS Group SW-2; IHSS 115, Original Landfill and IHSS 196, Filter Backwash Pond), Rocky Flats Environmental Technology Site, Golden, Colorado, March 10.

DOE, 2005b, Construction Completion and Certification Report for the Original Landfill at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005c, Closeout Report and Final Design Report and Design Calculation Documentation for the Accelerated Action for the Original Landfill at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE and EPA, 2003, Modifications to Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

**PAC REFERENCE NUMBERS: SW-133.1, SW-133.2, SW-133.3, SW-133.4,
SW-1701, AND SW-1702**

IHSS Number: 133.1, 133.2, 133.3, 133.4 and PACs SW-1701 and SW-1702
Current Operable Unit: 5
Former Operable Unit: 5
IHSS Group: SW-1
Unit Name: Ash Pits

This Final Update to the HRR for PACs SW-133.1, SW-133.2, SW-133.3, SW-133.4, SW-1701 and SW-1702 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The dispositions of IHSSs 133.1, 133.2, 133.3, and 133.4 and PACs SW-1701 & SW-1702 are summarized in this update. The following HRR volumes contain IHSSs 133.1, 133.2, 133.3, and 133.4 and PAC SW-1701 and SW-1702 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2001 Annual (DOE 2001);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2003 Annual (DOE 2003).

Dates(s) of Operation or Occurrence

1950s to 1968

Historical Summary

The locations for IHSSs 133.1, 133.2, 133.3, and 133.4 and PACs SW-1701 and SW-1702 are shown on Figure 12. Trenches were used for disposal of ash (and noncombustible trash) from the Incinerator (PAC SW-133.5) that operated from approximately 1952 until 1968. Ash from the Incinerator and “dump area” was first monitored in 1959 (DOE 1992a). Activities of 4,000 counts per minute (cpm) alpha and 30 millirems per hour (mrem/hr) beta were observed. Subsequently, the ash was buried in the trenches, known as Ash Pits.

In 1970, four Ash Pits (IHSSs 133.1, 133.2, 133.3, and 133.4) were identified as being south of the Incinerator area. Noncombustible trash, such as counting discs, broken glassware, and metal, was collected in a nearby dumpster and also disposed of in the Ash Pits. The trenches were approximately 150 to 200 ft long, 12 ft wide and 10 ft deep, and were staked with steel fence posts and surveyed. When a trench was considered full, approximately 3 ft of soil covered each trench location. It was estimated that approximately 30,000 ft³ of ash commingled with soil, and undocumented but relatively small volumes of noncombustible trash were buried in the Ash Pits.

Two additional burial trenches (PAC SW-1701 and PAC SW-1702) were identified in 1994 (DOE 1996) based on anomalies found during a time-domain electromagnetic (TDEM) conductivity survey. These two additional areas were confirmed through review of aerial photographs and samples collected from boreholes in the immediate area as shown on Figure 2.2 of the 2003 Annual Update for the HRR (DOE 2003). In addition, two anomalies adjacent to Ash Pits 2 and 4 (IHSSs 133.2 and 133.4, respectively) were identified based on the TDEM

conductivity survey. In each case, the southern most anomaly at each location was referred to as a twin investigation area as documented in the OU 5 Final Phase I RFI/RI Report (DOE 1996). The areas are shown on Figure 2.2 of the 2003 Annual Update for the HRR (DOE 2003a) and are referred to as the "Ghost Ash Pits."

Small quantities of depleted uranium-contaminated combustibles were burned along with the general combustible Plant refuse. One estimate indicates less than 100 g of depleted uranium were in the combustibles. A monthly ash sampling program was initiated in January 1962 and indicated there was 1 to 8 kg of depleted uranium per ton of ash (DOE 1992a).

In September 1954, five ash samples from the burning of Building 991 wastes were collected. The average activity of the ash was 4.5×10^7 disintegrations per minute per kilogram (dpm/kg) of dry ash. The alpha activity of the ash was approximately 100 times higher than the usual ash samples from the Incinerator.

In 1956, special monitoring was performed during and after contaminated waste was burned in the Plant Incinerator. Ash samples indicated 1.9 g of radioactive material (depleted uranium) per kg of ash. Smear surveys of the Incinerator before and after burning showed no increase in contamination.

IHSS/PAC Investigations

Sampling events were conducted from November 24, 1953, through December 9, 1954. In 1970, the locations of Ash Pits 1-1 through 1-4 were marked in the field. The ash in these trenches was evaluated and considered to present no problems unless disturbed and inhaled.

The ash pit sites and surrounding area were extensively sampled as part of the Final OU 5 RFI/RI (DOE 1992b, 1996) and through groundwater and surface water monitoring. The locations of boreholes, wells, surface soil samples, sediment samples, and surface water samples used in the evaluation of IHSSs 133.1, 133.2, 133.3, and 133.4, and PACs SW-1701 and SW-1702 are shown on Figure 2.2 of the 2001 Annual Update for the HRR (DOE 2001). Summaries of subsurface soil sampling results for the Ash Pits are presented in Tables 2.1 through 2.7 of the 2001 Annual Update. Table 2.8 of the 2001 Annual Update summarizes the results of 18 surface soil and sediment samples from across the Ash Pit area. Historical (1986-1995) groundwater sampling results from 16 well locations proximate to the Ash Pit area are summarized in Table 2.9 of the 2001 Annual Update. Additional results from supplementary groundwater samples taken in August 2001 are presented in Tables 2.10 and 2.11 of the 2001 Annual Update. Table 2.12 of the 2001 Annual Update presents results for surface water samples taken near the Ash Pits.

In addition to laboratory analysis for radionuclides, an HPGe survey of the entire Ash Pit area was conducted in 1993. Figures 2.3, 2.4, and 2.5 of the 2001 Annual Update show the survey results for americium-241, uranium-235, and uranium-238.

As a result of a regulatory agency request, two tables (Tables 2.5 and 2.6) were developed in the 2002 Annual Update for the HRR (DOE 2002) to summarize surface and subsurface soil sample results from boreholes located within each "Ghost Ash Pit." These data were assembled from pre-existing historical sampling results.

Results from the analysis of 18 surface soil and sediment samples at IHSSs 133.1, 133.2, and 133.4, and PAC SW-1702 indicated, with the exception of arsenic and beryllium, the metals

were not at concentrations exceeding the 1996 Tier II soil ALs (DOE et al. 1996). Beryllium and arsenic were found in subsurface soil at concentrations greater than RFCA Tier II soil ALs but below background values at IHSS 133.3 at maximum concentrations of 23 mg/kg and 21 mg/kg respectively. Arsenic (21 mg/kg), uranium-234 (350 pCi/g), and uranium-235 (68 pCi/g) were found at maximum concentrations or activities greater than RFCA Tier II subsurface soil ALs and uranium-238 (1,130 pCi/g) was found at maximum activities greater than RFCA Tier I subsurface soil ALs at PAC SW-1701. Of the arsenic and beryllium results, the one sample that had a concentration (arsenic) exceeding background, was below the WRW soil AL. No radionuclide exceedances were found. Consequently, no excavation of surface soil was required.

The 2003 Annual Update for the HRR (DOE 2003) presented a reassessment of the remaining Ash Pit sites not yet determined as NFA (IHSSs 133.1, 133.2, and 133.4, and PAC SW-1702) using existing data (that is, no additional data were included in the reassessment relative to that included in the 2001 Annual Update for the HRR). The reassessment used revised soil ALs and the SSRS (DOE et al. 2003). Applicable data tables and figures from the 2001 Annual Update for the HRR were reiterated and additional figures and tables comparing sampling results to RFCA WRW soil ALs were incorporated.

Subsurface soil concentrations of uranium isotopes and a few metals (chromium and lead) were found to exceed RFCA WRW soil ALs at IHSSs 133.1, 133.2, and 133.4, and PAC SW-1702. The SSRS showed that there was no significant potential for these soils to become exposed at the surface or to contaminate nearby ground or surface water.

No Further Action Recommendation

The Ash Pit sites were addressed through the consultative process in an NFA Working Group meeting on December 5, 2001. Based on the data and NFA justification provided for the Ash Pit sites in the 2001 Annual Update for the HRR (DOE 2001), agreement was reached that an NFA was justified for IHSS 133.3 and PAC SW-1701. NFAs were verbally agreed to in the December 5, 2001 meeting, and formally approved by EPA and CDPHE (the LRA) for IHSS 133.3 and PAC SW-1701 in a letter dated February 14, 2002 (EPA and CDPHE 2002).

In the course of the December 5, 2001, meeting with regulatory agencies, it was agreed that the "Ghost" sites could be eliminated as PACs and removed from existing maps contingent on the requirement that analytical data specific to the Ghost sites be presented in the 2002 Annual Update for the HRR (DOE 2002). This requirement was met by assembling Tables 2.5 and 2.6 in the 2002 Annual Update. The tables showed that all of the data from locations within the Ghost sites were below RFCA Tier II soil ALs (DOE et al. 1996) with the exception of one beryllium detection and one arsenic detection, which were slightly above background (that is, Tier II soil ALs applicable at the time of writing were below background).

The consensus in the December 5, 2001 meeting regarding the remaining Ash Pit sites (IHSSs 133.1, 133.2, and 133.4 and PAC SW-1702) was that their status would be put on hold pending anticipated revisions to the subsurface soil ALs. These remaining Ash Pit sites were reassessed in the 2003 Annual Update for the HRR (DOE 2003). The reassessment used the RFCA WRW soil ALs (DOE et al. 2003) and incorporated an SSRS.

NFAA status for IHSSs 133.1, 133.2, and 133.4 and PAC SW-1702 was proposed in the 2003 Annual Update for the HRR based upon the following:

- The SSRS indicated erosion of subsurface soil from the ash pits was unlikely.

- The Ash Pits area is in a stable configuration with regard to slope stability and erosion.
- There is little potential for contaminated runoff to impact surface water quality, because the wastes are buried and covered and are located outside of the 100-year floodplain of the nearest drainage (Woman Creek).
- Possible groundwater impacts from the Ash Pits is limited to low-level uranium contamination; however, the levels do not exceed surface water ALs in Woman Creek and therefore are unlikely to impact surface water quality.

In accordance with stewardship recommendations at the Ash pits, a marker placed near the southwestern corner of the westernmost ash pit to monitor bank erosion, if any. DOE conducted an assessment of the groundwater monitoring network in the vicinity of the ash pits. In consultation with the regulatory agencies, it was determined that two additional wells were needed to complete the monitoring network. These wells were installed in 2003 (DOE 2005). The Summary Report indicates that there are no significant impacts to groundwater and surface water from the Ash Pits. The Integrated Monitoring Plan (IMP) Water Working Group decided that there was no need for further monitoring of this area (RCR dated September 26, 2005).

DOE received approval of NFAA status for IHSS 133.3 and PAC SW-1701 from EPA (LRA) and CDPHE in a letter dated February 14, 2002. DOE received approval of NFAA status for IHSSs 133.1, 133.2, and 133.4 and PAC SW-1702 from EPA in a letter dated June 12, 2003 (EPA 2003).

Comments

Sites 32 and 33 referenced in the BZ Contamination Report Area are part of these IHSSs.

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 5, Woman Creek Drainage, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1996, Final Phase I RFI/RI Report, Woman Creek Drainage, Operable Unit 5, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Ash Pits Groundwater Contamination Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2003, Correspondence to R.J. DiSalvo, DOE RFFO, from T. Rehder, EPA Region VIII, Re: No Further Action (NFAA) Justification for Ash Pits PAC Reference Number(s) SW-133.1, SW-133.2, SW-133.4 and 1702 (dated June 11, 2003), NFAA Justification for Trench T-7 PAC Reference Number: NE 11.4 9 dated May 21, 2003, NFAA Justification Trenches T-3 and T-4 PAC Reference Number: 111.1 (dated May 21, 2003), June 12.

EPA and CDPHE, 2002, Correspondence to J. Legare, DOE RFFO, from T. Rehder, EPA Region VIII, S. Gunderson, CDPHE, Re: Approval of NFA Designation for IHSSs & PACs, February 14.

PAC REFERENCE NUMBER: SW-133.5

IHSS Number: 133.5
Current Operable Unit: BZ
Former Operable Unit: 5
IHSS Group: SW-1
Unit Name: Incinerator Facility

This Final Update to the HRR for PAC SW-133.5 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 133.5 is summarized in this update. The following HRR volumes contain IHSS 133.5 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2004 Annual (DOE 2004).

Dates(s) of Operation or Occurrence

1952 to 1968

Historical Summary

An Incinerator (Facility 219 or Building 219) was located south of the West Access Road near the original Rocky Flats western boundary. Based upon the OU 5 RFI/RI Report (DOE 1996), the location of IHSS 133.5, as originally reported in the HRR is inaccurate. The revised location for IHSS 133.5 is shown on Figure 12.

The Incinerator was located on the side of a hill that slopes southward towards Woman Creek. The Incinerator was approximately 24 ft high and constructed of rebar reinforced concrete walls, a concrete slab and concrete wing walls. The slab was approximately 12 ft by 16 ft. Design and as-built drawings of the Incinerator indicate it was a significant structure with an emission stack approximately 32 ft high (DOE 1992a).

The Incinerator was in operation from 1952 through August 1968, and was used to burn office wastes or general site waste. However, an unknown quantity of depleted uranium-contaminated material was burned in the Incinerator and estimated to contain at least 100 g of depleted uranium. Incineration reduced waste volume but resulted in concentrating low levels of radionuclides and metals and resulted in materials now considered hazardous substances being released with the stack emissions (DOE 1992a).

Records indicated the area around the Incinerator may have been backfilled with ash; however, it was determined that the fill was soil. Low-angle oblique photographs of the Incinerator indicated fill material almost to the height of the Incinerator roof. Ash was also placed in the ash pits (PACs SW-133.1-133.4 and SW-1701 and SW-1702). An "ash dump" south of the plant was monitored in May 1959 and found to contain up to 4,000 cpm alpha activity and 20 mrem/hr beta activity (DOE 1992a).

Until 1959, ash and noncombustible material from the Incinerator were placed around the Incinerator and to the south near the concrete wash pad area (PAC SW-133.6). After 1959, the ash was placed in Ash Pits to the south, southeast, and east of the Incinerator (see IHSSs SW-133.1-133.4 and PACs SW-1701 and SW-1702). Residual ash was sampled and found to contain measurable amounts of uranium contamination. A monthly ash sampling program was initiated in January 1962 and data were available in the monthly History Reports by the Waste Disposal Coordination Group (DOE 1992a).

Air emission samples were collected during burning operations in September 1956. Smear surveys of the Incinerator before and after burning of contaminated waste showed no increase in contamination. Air sampling of the Incinerator continued in 1958 during combustion of radioactively contaminated trash from Buildings 444 and 447; however, no sample results could be located (DOE 1992a).

In 1960, it was necessary to reline the firebox and stack with a plastic refractory. Between 1960 and 1968, the Incinerator continued to deteriorate until it was necessary to cease its use and dispose of trash in some other manner. The Present Landfill (PAC NW-114) was constructed as a substitute for the Incinerator, and waste disposal to the Present Landfill began on August 14, 1968 (DOE 1992a).

A review of aerial photographs indicated the Incinerator was present August 7, 1969, and was partially dismantled by August 6, 1971. No documentation was found that described the dismantling of the Incinerator, however, it was presumed removed. During concrete debris removal from PAC SW-133.6 in April 2003, the buried Incinerator was discovered (DOE 2003a).

IHSS Investigations

IHSS 133.5 was investigated twice. Once as part of the OU 5 RFI/RI (DOE 1996) and again as part of the RFCA Accelerated Action process (DOE et al 1996). Based on process knowledge, radionuclides, metals, VOCs, SVOCs, and Dioxins/Furans were considered PCOCs at this IHSS.

OU 5 RFI/RI Activities

Information presented in the Final Phase I RFI/RI Report OU 5 (DOE 1992b, 1996) indicated there was no risk to human health or the environment from OU 5, including the Incinerator. OU 5 data were reviewed and presented in the 2001 HRR Annual Update (DOE 2001) and are briefly summarized in the following sections.

Four boreholes (55193, 55293, 55393, and 55493) were placed within, or adjacent to, IHSS 133.5 (Figure 2.2, 2001 HRR Annual Update [DOE 2001]). All analyte concentrations in surface and subsurface soil were less than RFCA Tier I ALs (DOE et al. 2000). Barium, copper, manganese, and uranium-238 concentrations in soil were greater than background values, but significantly less than RFCA Tier II ALs. These data are presented in Table 2.14 of the 2001 HRR Annual Update (DOE 2001) and the OU 5 RFI/RI Report (DOE 1996).

Groundwater

Downgradient wells from IHSS 133.5 include wells 55194, 59093, 55394, and 62593. These wells monitor the Incinerator and Ash Pit area. Groundwater analytical results in comparison to

RFCA Tier I and Tier II ALs are presented in Table 2.9 of the 2001 HRR Annual Update (DOE 2001).

Based on analytical data, there are a number of VOCs that appear sporadically in the groundwater data. Specifically, toluene, benzene, 1,1-dichloroethene, and tetrachloroethene have been detected at various times in the same well 59093. For each sampling event, these compounds were detected only once and never detected again. It is unlikely that these compounds are actually present at these locations and probably represent anomalous data. Additional information is presented in the Annual Groundwater Monitoring Reports.

Uranium-233/234 and uranium-238 were detected at levels slightly above RFCA Tier II ALs. These isotopes have been found at elevated levels in nearby ash pits, but were not identified at levels above background from the IHSS 133.5 subsurface soil samples. Based on the data, it is unlikely that IHSS 133.5 is the source for these radionuclides.

Surface Water

Nearby surface water locations have had contaminant concentrations above RFCA standards and action levels for aluminum, antimony, cadmium, copper, iron, lead, manganese, mercury, silver, americium-241, gross alpha, gross beta, and plutonium-239/240. These data are presented in Table 2.12 of the 2001 HRR Annual Update (DOE 2001). Many of these may be from natural sources (aluminum, antimony, iron, manganese, and silver) or from the ash pits. These metals were not identified at concentrations greater than RFCA Tier II ALs (DOE et al. 2000) in any of the boreholes installed within or adjacent to IHSS 133.5. Further downgradient, at SW-027 (surface water Point of Evaluation [POE]) and at Pond C-2, the IHSS 133.5 PCOCs have never been detected above RFCA surface water standards.

Airborne Pathways

Airborne pathways were evaluated during the OU 5 RFI/RI for IHSSs SW-133.1 through SW-133.6, as part of an investigation for wind resuspension and erosion potential of contaminated soil. Airborne pathways were also evaluated as part of the risk assessment. No substantial risk was found, because there are minimal levels of contaminants in the soil (DOE 1996).

Radiological Surveys

In addition to OU 5 RFI/RI sampling, an HPGe survey was conducted of the entire area. The results of this survey are presented in Figures 2.3, 2.4 and 2.5 of the 2001 HRR Annual Update (DOE 2001). Americium-241 was not detected during the survey. Uranium concentrations were consistent with the uranium detected in the groundwater. Although one measurement for uranium-238 produced an average soil concentration of 18.8 pCi/g, this activity is well below the RFCA Tier II AL of 103 pCi/g (DOE et al. 2000).

Accelerated Action Activities

The buried Incinerator was found during concrete debris removal activities in 2003. Previous documentation indicated the Incinerator had likely been removed. ER RSOP Notification #03-09 (DOE 2003a) was developed for the removal of the Incinerator and RFCA (DOE et al. 1996) accelerated action activities took place from April 2003 to November 2003.

The IHSS SW-133.5 Incinerator soot-covered concrete rubble, concrete slabs, potential asbestos-containing material (ACM), two drum carcasses, and ash-like material and laboratory debris mixed with clean fill were removed and disposed (DOE 2003b). Fill in the Incinerator was soil, which was removed and later returned to the excavation. After the Incinerator was removed, the area was backfilled with approximately 20 ft of soil and regraded.

Confirmation samples were collected in accordance with ER RSOP Notification #03-09 (DOE 2003a) from 30 surface soil locations and five subsurface soil locations. Analytical results indicated all COCs were less than RFCA WRW soil ALs (DOE et al. 2003). One confirmation sample at the bottom of the excavation was analyzed for dioxins and furans. While some congeners were detected, the sampling location is beneath approximately 20 ft of soil. Accelerated action activities and results of confirmation sampling are presented in the Final Closeout Report for IHSS Group SW-1 (DOE 2003b).

Maximum analytical result values for selected residual analytes include: antimony 7.19 mg/kg, arsenic 18.20 mg/kg, beryllium 4.40 mg/kg, cadmium 30.00 mg/kg, chromium 61.00 mg/kg, lead 220.00 mg/kg, mercury 0.28 mg/kg, nickel 52.40 mg/kg, uranium (total) 85.00 mg/kg, vanadium 146.00 mg/kg, uranium-234 11.16 pCi/g, uranium-235 0.40 pCi/g, and uranium-238 11.16 pCi/g.

No Further Action Recommendation

RFI/RI data were summarized in the OU 5 RFI/RI (DOE 1996) and IHSS 133.5 was recommended for an NFA based on the HHRA. Review of the OU 5 RFI/RI data indicated that all COC concentrations in soil were less than RFCA ALs (DOE et al. 2000). Groundwater data, collected during the summer 2001 field season, indicated uranium-233/234 and uranium-238 were detected at activities slightly greater than RFCA Tier II groundwater ALs. There is no indication surface water contamination exists from IHSS 133.5.

Accelerated action data indicate all residual COC concentrations are less than RFCA WRW soil ALs (DOE et al. 2003). Results of the SSRS indicate additional action is not necessary. Results of the stewardship evaluation indicate additional action is not necessary.

In accordance with RFCA, an NFAA is justified for IHSS 133.5 based on the following:

- Results of the OU 5 RFI/RI indicated contaminant concentrations in soil were less than RFCA Tier I soil ALs.
- Results of groundwater sampling indicated several VOCs were found only during one sampling episode.
- Results of groundwater sampling indicated uranium-233/234 and -238 were found sporadically in groundwater wells at concentrations greater than RFCA Tier II groundwater ALs.
- Results of surface water sampling indicate some metal concentrations and radionuclide activities were greater than RFCA standards and ALs. However, these constituents were not identified above Tier II ALs in any of the boreholes installed within the ash pit and Incinerator area.
- The Incinerator, soot-covered concrete rubble, concrete slabs, potential ACM, two drum carcasses, and ash-like material and laboratory debris mixed with clean fill were removed and disposed (DOE 2003b).

- Results of confirmation sampling indicated contaminant concentrations were less than WRW ALs.
- Results of the SSRS did not indicate additional action was necessary.
- Results of the Stewardship Evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group SW-1 by the regulatory agencies, DOE received approval from EPA (the LRA) of the NFAA status for IHSS Group SW-1 on December 18, 2003 (EPA 2003).

Comments

None

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 5, Woman Creek Drainage, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1996, Final RCRA Facility Investigation/Remedial Investigation (RFI/RI) Report, Woman Creek Drainage, Operable Unit 5, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-09, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Closeout Report for IHSS Group SW-1, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2000, Final Rocky Flats Cleanup Agreement Attachment 5, Rocky Flats Environmental Technology Site Action Levels and Standards Framework For Surface Water, Ground Water, and Soils, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2003, Correspondence to J. Legare, DOE RFFO, from M. Aguilar, EPA, RE: Closeout Report for IHSS Group SW-1, December 18.

PAC REFERENCE NUMBER: SW-133.6

IHSS Number: 133.6
Current Operable Unit: 5
Former Operable Unit: 5
IHSS Group: SW-1
Unit Name: Concrete Wash Pad

This Final Update to the HRR for PAC SW-133.6 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of IHSS 133.6 is summarized in this update. The following HRR volumes contain IHSS 133.6 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2004 Annual (DOE 2004).

Dates(s) of Operation or Occurrence

1953 to March 1979

Historical Summary

The location for IHSS 133.6 is shown on Figure 12. Excess concrete from construction activities at Rocky Flats was routinely washed from concrete trucks southwest of the Plant. In March 1979, Plant Services was requested to clean up debris from past cement truck washouts, and all future cement truck washouts were to be conducted at the Present Landfill (PAC NW-114). Reference was made to ash being disposed southwest of the Incinerator, which may have been close to this area (DOE 1992). Ground disturbance in the area is apparent in aerial photographs taken beginning in 1953, and in later Plant photographs (DOE 1992).

The Concrete Wash Pad was a waste concrete disposal site. However, concrete is not a hazardous waste. Potentially contaminated ash generated from the Incinerator may have been deposited southwest of the Incinerator in the area of the Concrete Wash Pad.

IHSS Investigations

During removal of concrete as a best management practice (BMP) at this location, the adjacent buried former Plant Incinerator (PAC SW-133.5) was discovered in April 2003. Notification of the planned accelerated action for the Incinerator (IHSS 133.6) was provided in ER RSOP Notification #03-09 (DOE 2003a), which was approved by EPA on September 4, 2003 (EPA 2003a). While the Notification was specific to the Incinerator, the Closeout Report included the removal of the clean concrete from the Concrete Wash Pad. This removal action was not considered an accelerated action because the concrete was not contaminated. The concrete, up to 5 ft thick in some places, was broken up using a hydraulic hammer and recycled in accordance with the RSOP for Recycling Concrete (DOE 2003b). The concrete pieces were turned over and surveyed to determine whether radionuclide contamination was present.

Approximately 3,000 cy of concrete debris were taken from the adjacent area and sent to the Building 850 recycle pile (DOE 2003c).

One surface and two subsurface soil characterization samples were obtained at IHSS 133.6. Analyses included radionuclides and metals. Because all contaminant concentrations in soil were less than RFCA WRW soil ALs, no soil was removed, and confirmation sampling was not conducted. Results of the accelerated action activities at IHSS 133.6 are reported in the Final Closeout Report for IHSS Group SW-1 (which includes IHSS 133.6) (DOE 2003c).

No Further Action Recommendation

Based on the actions taken and the results of the SSRS, an NFAA status for IHSS 133.6 was recommended in the Final Closeout Report for IHSS Group SW-1 (DOE 2003c). No long-term stewardship activities are recommended for the IHSS beyond the generally applicable Site requirements that may be imposed on this area in the future. No specific engineering controls or environmental monitoring are anticipated as a result of the conditions remaining at the IHSS.

After review of the Closeout Report by the regulatory agencies, DOE received approval from EPA (the LRA) of the NFAA status for IHSS Group SW-1 on December 18, 2003 (EPA 2003b).

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-09, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2003b, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003c, Final Closeout Report for IHSS Group SW-1, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2003a, ER RSOP Notification #03-09 Approval Letter, Rocky Flats Environmental Technology Site, Golden, Colorado, September 4.

EPA, 2003b, Correspondence to J. Legare, DOE RFFO, from M. Aguilar, EPA, RE: Closeout Report for IHSS Group SW-1, December 18.

PAC REFERENCE NUMBER: SW-196

IHSS Number: 196
Current Operable Unit: IA
Former Operable Unit: 5
IHSS Group: SW-2
Unit Name: Water Treatment Plant Backwash Pond

The Final Update to the HRR for PAC SW-196 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 196 is summarized in this update. The following HRR volume contains IHSS 196 information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

March 1955 to October 1964

Historical Summary

From the early 1950s until the 1970s, filter backwash wastewater generated by the raw water treatment process in Building 124 to make potable water was discharged to a settling and evaporation pond located roughly in the center of PAC-SW-115 (the Original Landfill), and designated the Water Treatment Plant Backwash Pond, IHSS 196 (DOE 2005a).

The water treatment plant backwash pond, also known as Pond 6, was located south of the water treatment plant (Building 124) as shown in Figure 12. It was constructed between January and March 1955. A July 1955 aerial photograph shows a pond on the north slope of the Woman Creek drainage approximately 800 ft south of Building 124. The water treatment plant backwash discharge pipeline is also apparent on this aerial photograph which suggests that this area was the pond for receiving the water treatment plant backwash (DOE 1992a).

An original HRR reference stated that Pond 6 was used as an "evaporation/settling pond." The pond was described as an unlined pond on the south side of the water treatment plant building (Building 124). Aerial photographs suggest that it was no longer active in October 1964. However, a 1974 reference suggests that Woman Creek continued to receive filter backwash discharges from the water treatment plant (DOE 1992a).

No documentation was found that specifically identified Pond 6 as the location of a release. However, Pond 6 was built in the vicinity of the water treatment plant backwash discharge pipeline. An indirect reference states that the pond was used for back flushing sand filters. The backwash water would have contained flocculants (aluminum sulfate or lime), residual chlorine, and suspended solids. The effluent from the water treatment plant in 1953 was discontinuous and was made up of filter backwash, filter prewash, sludge blowdown, and other waste water from the treatment of raw water. It contained all of the silt, mud, and filterable solids removed from the raw water. The characteristics of raw water were seasonally variable and therefore, the characteristics of the backwash effluent were also variable. No documentation was found that detailed the fate of any released constituents (DOE 1992a).

It is possible that the Pond 6 location was used prior to pond construction as the "plant burning pit" for dumping, burning, and discharging of miscellaneous waste (DOE 1992a). A soil cover was placed over the disposed waste of the Original Landfill when it was closed in 1968 (DOE 2005a).

IHSS Investigations

IHSSs 115 and 196 were formerly part of OU 5, the Woman Creek Priority Drainage, which was consolidated into the IA OU when RFCA became effective in July 1996 (DOE et al. 1996). Prior to this consolidation, a Phase I RFI/RI for OU 5 was conducted in accordance with the RFI/RI Work Plan (DOE 1992b, 1994). Because IHSS 196 was located within the boundaries of IHSS 115, these two IHSSs were addressed together in the OU 5 Phase I RFI/RI (DOE 1996). For purposes of the investigation work, the OU 5 IHSSs (and PACs) were separated into specific AOCs. IHSSs 115 and 196 were designated as AOC 1 (DOE 2005a).

At least five soil samples were collected in the IHSS 196 area. Results indicated uranium-233/234, uranium-235, uranium-238, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected at concentrations greater than the RFCA (DOE et al. 2003) WRW soil ALs. (DOE 2005a). Results for subsurface soil indicated benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected at concentrations greater than the RFCA WRW soil ALs.

Because IHSS 115 is included in the Original Landfill, the RFCA accelerated action at the Original Landfill encompassed IHSS 196 (DOE 2005a). The RAOs called for surface soil hot spot removals, area grading, buttress fill (a soil cover), engineering controls, and site monitoring (DOE 2005a). Hot spot removal was not conducted at IHSS 115.

No Further Accelerated Action Recommendation

Based on the completion of the Original Landfill cover and review of the subsequent Closeout Report and Construction, Completion and Certification Report (DOE 2005b), NFAA status was approved by CDPHE (LRA) for IHSSs 115 and 196 on _____.

Comments

None

References

CDPHE, 2005, Approval Letter

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 5 Woman Creek Priority Drainage, Volume I, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1994, Draft Final Technical Memorandum No. 15, Addendum to Final Phase I RFI/RI Work Plan, Amended Filed Sampling Plan, Volume 2, Rocky Flats Plant, Golden, Colorado, May.

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Volume 1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2005a, Final Interim Measure/Interim Remedial Action for the Original Landfill (Including IHSSS Group SW-2; IHSS 115, Original Landfill and IHSS 196, Filter Backwash Pond), Rocky Flats Environmental Technology Site, Golden, Colorado, March 10.

DOE, 2005b, Closeout Report and Construction Completion and Certification Report for the Original Landfill at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: SW-1700

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Fuel Spill into Woman Creek Drainage

The Final Update to the HRR for PAC SW-1700 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC SW-1700 is summarized in this update. The following HRR volume contains PAC SW-1700 information:

Original Report – 1992 (DOE 1992); and
Update Report.– 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 19, 1975

Historical Summary

The location for PAC SW-1700 is shown on Figure 12. An armored vehicle overturned into the Woman Creek Drainage in the vicinity of the concrete wash pad (PAC SW-133.6). The event occurred while the vehicle stalled on the steep hill south of the drainage. It rolled back into the drainage and overturned; spilling fuel into the drainage. The volume of spilled fuel and whether it was diesel or gasoline is unknown. During the following week, a visible oil slick was observed on Woman Creek (DOE 1992).

The incident occurred on a Sunday and management personnel were immediately informed of the event. The vehicle was righted and removed from the area. No documentation was found detailing clean-up activities or the fate of the released constituents (DOE 1992).

IHSS Investigations

No further investigation was required (CDPHE and EPA 2002).

No Further Accelerated Action Recommendation

PAC SW-1700 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that PAC SW-1700 met the criteria for NFA as defined in RFCA Attachment 6 (DOE et al. 1996). An NFA was verbally agreed to in the November 14, 2001 meeting, and was formally approved in a letter dated February 14, 2002 (CDPHE and EPA [the LRA] 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO; from S. Gunderson, CDPHE; T. Rehder, EPA Region VIII; RE: Approval of NFA Designation for IHSSs & PACs, February 14, 2002.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July

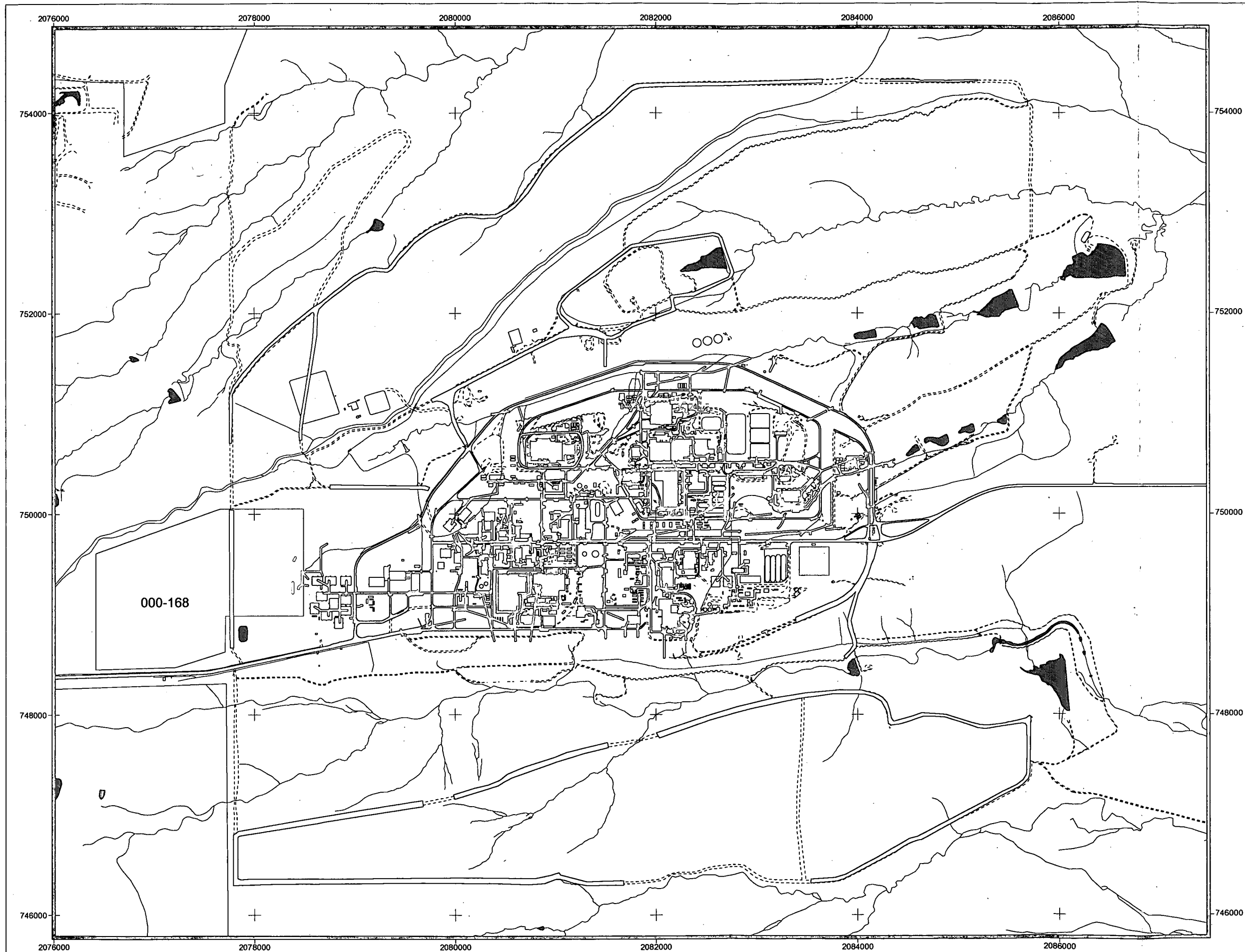
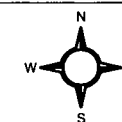


Figure 13
HRR 000 Area
Storm Drains and
Sanitary Sewers

KEY

- Storm Drains (000-505)
- Sanitary Sewer (000-500)
- Stream
- Dirt road
- PAC 000-501
- IHSS
- Lake
- Asphalt
- Building
- Site Boundary



1000 0 1000 Feet

Scale = 1: 18850

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.28.05








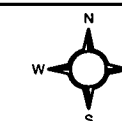
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Figure 14
HRR 000 Area
OPWL, NPWL, IHSSs,
and PACS

KEY

-  Stream
-  Dirt Road
-  OPWL (000-121)
-  NPWL (000-504)

-  PAC
-  IHSS
-  Lake
-  Asphalt
-  Building



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Scale = 1: 6200

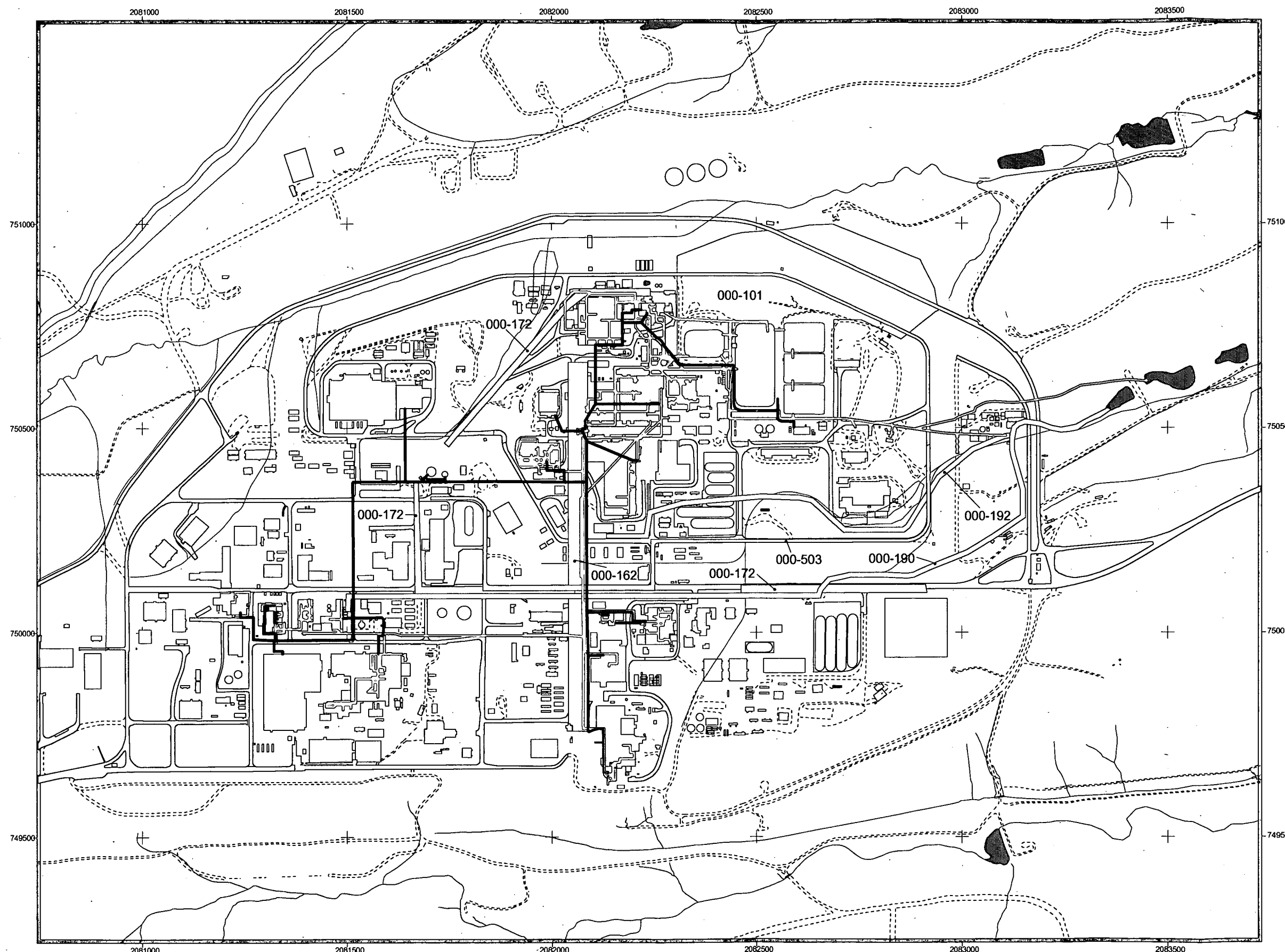
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 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.28.05



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PAC REFERENCE NUMBER: 000-101

IHSS Number: 101
Current Operable Unit: IA
Former Operable Unit: 4
IHSS Group: 000-1
Unit Name: Solar Evaporation Ponds

This Final Update to the HRR for PAC 000-101 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 101 is summarized in this update. The following HRR volumes contain IHSS 101 information:

Original Report – 1992 (DOE 1992);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1953 to 2002

Historical Summary

The Solar Evaporation Ponds (SEP) (IHSS 101) were used primarily for the disposal of low-level radioactive wastes contaminated with high concentrations of nitrate (DOE 2003). The location of IHSS 101 is shown on Figure 14. The SEP were also used for the disposal of other difficult-to-treat wastes, including cyanide wastes, acid wastes, radiography solutions, sanitary landfill leachate, and sewer sludge. The first pond (Pond 2) was constructed in 1953, and an auxiliary pond was built in 1955 adjacent to the southeastern corner of Pond 2. SEP Pond 207A, the first lined pond, was constructed after nitrate contamination was detected offsite. The lining of this pond consisted of asphalt impregnated wood approximately 1/2-inch thick. SEP Pond 207A was constructed immediately to the east of the two earthen ponds.

Following construction of SEP Pond 207A, the original and auxiliary ponds were upgraded. The original clay-lined pond had additional clay added to the eastern edge, and the auxiliary pond was fully lined with clay. These ponds were then used routinely until June 1960. A third earthen cell, known as either Pond 2C or 2D, was constructed in April 1959. The three earthen cells were used in series, and the effluent from these three ponds was discharged to the sanitary wastewater treatment plant.

Construction of SEP Pond 207B began in November 1959. The ponds were located immediately east of SEP Pond 207A and consisted of three separate cells (North, Center, and South) lined with asphalt planks. However, leaks were almost immediately identified. The cells were taken out of service and repaired one at a time. Repairs were completed in May 1964.

In 1970, Pond 2 and the earthen pond immediately east of it (Pond 2C or 2D) were removed, and SEP Pond 207C was constructed to allow the transfer of water from other SEP so that they could be repaired. The design of SEP Pond 207C included a leak detection pipe placed immediately

beneath the pond running from south to north where it could drain into a leak detection sump. SEP 207C remained in constant service until it was removed in late 2002.

Two sumps, six trenches, and french drains were constructed in the area north of the SEP to allow the collection and return of SEP contaminated groundwater to the SEP. These actions were taken to keep water in the A-Series Drainage below the State's then promulgated limit for nitrates in drinking water (10 mg/L). This system was expanded in the early 1980s because of concerns over the existence of groundwater seeps immediately north of the SEP and was referred to as the ITS. The ITS included a new french drain that paralleled the old Patrol Road. This new french drain was built with gravel backfill from the drain to the surface so that it would collect both groundwater and surface water flow. This extension also provided for the collection of footing drain flows from Buildings 771 and 774 through a 4-inch-diameter poly vinyl chloride (PVC) pipe. This system collected groundwater and surface water runoff (from the area immediately north of the SEP and south of the Perimeter Security Zone (PSZ) perimeter patrol road), which drained by gravity to a pump station located near North Walnut Creek and was pumped to SEP 207B-North. Water from this pond was transferred to other SEP or to the Building 374 evaporator. Some of the water from SEP Pond 207B-North was spray irrigated in the West Spray Field (PAC 000-168).

During November 1960, six groundwater monitoring wells were installed near SEP Pond 207B. The first chemical analysis of water collected from these wells in January 1961 indicated that nitrate contamination was present in the groundwater in concentrations up to 800 mg/L (DOE 2003a).

During removal of Pond 2 Auxiliary (in preparation for the construction of Building 779), surveys of the area soil indicated readings between 2,500 to 5,000 cpm. Clay samples of the pond had 75,000 dpm/kg, which were described as 2.5 times soil background in the area (DOE 2003a). Historically, radiological activities in surface soils near the edges of the SEP were observed to be low level (102 dpm/100 cm²) (DOE 2003a).

From fall 1976 to fall 1977, SEP Pond 207B was cleaned and decommissioned for storage of process wastewater. All three cells of SEP Pond 207B were cleaned, but only SEP Pond 207B-South was relined. This relining was done with a hypalon liner. During these cleanout and relining activities, soil to the south, east, and between the SEP was also removed. Process waste was not reintroduced to the ponds. After the cleanout activities, these ponds were used for reverse osmosis plant brine storage and evaporation, treated sanitary sewage effluent, and contaminated groundwater collected by the ITS.

In 1986, a RCRA Part B operating permit application was submitted to CDH. The Plant reported that the SEP was an interim status unit scheduled to be closed. The SEP and surrounding contaminated area was identified as a SWMU which later became IHSS 101.

The cleanout of process waste sludge in the SEP Pond 207A began in 1986. The first step was to construct Building 788 where pond sludge and Portland cement were mixed to create "pondcrete." Building 788 was constructed between SEP Ponds 207A and 207C. Problems with the cleanout occurred at times, including pondcrete not hardening properly, and flooding of some of the valve pits used to transfer SEP water to the Building 374 evaporator. The removal of the process waste and sludge from SEP 207A was completed in 1988. The final volume of water was transferred to the SEP Pond 207B. However, in March 1990, contaminated groundwater transferred to the SEP Pond 207B from the ITS was placed in SEP Pond 207A in order to

prevent overtopping of SEP Pond 207B. All of the water present in SEP Pond 207A was removed during 1991 and evaporated in Building 374.

Between 1993 and 1995, wastewater and the remaining sludge from the SEP Ponds 207A- and B-Series Ponds was removed as part of the Accelerated Sludge Removal Project. The purpose of the removal efforts was to remove the source of nitrate and uranium contamination. The work was completed in 1995 and was conducted as a routine operation within a RCRA Interim Status Unit Undergoing Closure. Following removal, the ponds were rinsed (except for SEP Pond 207C which was rinsed in 2002) and the water was pumped to Building 374 for evaporation. The remaining sludge was stored in tanks on the 750 Pad and has since been dewatered, packaged, and shipped to an off-site disposal facility (DOE 2002a).

IHSS Investigations

The SEP was a RCRA interim status unit which was closed in accordance with the SEP PAM, RCRA Closure of the RFETS Solar Evaporation Ponds (DOE 2002a). Closure was conducted under alternate RCRA interim status closure requirements found in 6 CCR 1007-3, Section 265.110(d), which allows a risk-based analysis and compliance with the closure performance standards in 6 CCR 1007-3, Section 265.111(a) and (b). Releases from other units in the area of the SEP also contributed to the SEP area of contamination. These units included RCRA Unit 21 (Building 788 Permacon), Unit 48 (Clarifer), and RCRA Unit 374.3 (910/374 above ground pipeline, a portion of New Process Waste Line [NPWL] PAC 000-504).

The PAM addressed the closure of the SEP RCRA interim status unit and included a risk assessment for COCs – the HHRA of the SEP (an attachment to the PAM). Results of the risk assessment indicated low risk to a WRW, therefore no action was required for either RCRA or radionuclide COCs. As a BMP, the SEP berms were pushed in, clean fill soil was brought in and the area regraded in accordance with the PAM (DOE 2002a).

As a separate action (and prior to the berms being pushed in), ER RSOP Notification #02-08 (DOE 2002b) was developed to conduct accelerated actions and RCRA closure for portions of IHSSs within the SEP AOC, three RCRA units (21, 48 and portions of 374.3), and remove soil with contaminant concentrations greater than RFCA Tier soil I ALs (DOE et al. 1996). Also removed were six surface soil locations with activities of americium-241 or plutonium-239/240 that resulted in an excess cancer rate to a WRW greater than 1×10^{-5} , or concentrations of nonradionuclides (for example, cadmium) increased the noncarcinogenic risk to the WRW.

RFCA accelerated actions (DOE et al. 1996) for IHSSs within the SEP AOC, were conducted between August 6 and November 20, 2002, in accordance with IASAP Addendum #IA-02-07 (DOE 2002c) and ER RSOP Notification #02-08 (DOE 2002b). Removal activities involved the removal of all concrete slabs, associated foundations, all above-ground process waste lines (NPWL), some belowground process waste lines (including OPWL P-26 within the IHSS), Valve Pit #1, miscellaneous valve components, all sumps and pumps, and contaminated soil (hot spots) (DOE 2003b). Some belowground waste lines and drain lines remain (for example, OPWL P-36, P-37 and P-38); however, all of these lines were disrupted (plugged). The two valve pits in the SEP Ponds 207B berms were not removed, because they are located more than 6 ft below grade; however, the valve stems and casings were removed. The SEP Ponds 207A, 207B, and 207C drain/leak detection lines were disrupted where they discharged to a sump and were filled with grout or foam. Numerous lysimeters in the area also were removed.

The accelerated actions also included closure of three RCRA Units (#21, 48, and 374.3). RCRA Units 21 and 48 had been partially closed prior to the accelerated action, and removal of the remaining concrete slabs associated with Building 788, the clarifier, and the pump transfer station at Building 308A constituted final closure of the two RCRA units (DOE 2003b). RCRA Unit 374.3 consisted of the NPWL, and removal of the aboveground line section from Building 910 to Building 774 constituted partial closure of the RCRA unit.

Fourteen surface and 25 subsurface soil samples were collected and analyzed for radionuclides and metals. Some of the samples were also analyzed for nitrate. All contaminant concentrations and activities in the sampled areas were below RFCA Tier II soil ALs (DOE et al. 1996), except for one beryllium concentration and 16 arsenic concentrations (DOE 2003b). The beryllium concentration that exceeded the Tier II soil AL was 1.10 mg/kg, and the AL was 1.04 mg/kg. The arsenic concentrations that exceeded the Tier II soil AL ranged from 13.0 to 36.3 mg/kg, and the AL was 2.99 mg/kg. All exceedances were significantly below the RFCA Tier I soil ALs. All contaminant concentrations and activities were below the WRW soil ALs (DOE et al. 2003), except for one subsurface manganese concentration and 8 arsenic concentrations (in surface and subsurface soil). The manganese concentration that exceeded the WRW soil AL was 5,900 mg/kg, and the WRW soil AL is 3,480 mg/kg. The arsenic concentrations that exceeded the WRW soil AL ranged from 22.4 to 36.3 mg/kg, and the WRW soil AL is 22.2 mg/kg.

Confirmation sampling was conducted in the excavations where the six hot spot soil areas were removed to confirm that sufficient soil had been removed (that is, that residual contaminant concentrations were below RFCA Tier II soil ALs). All contaminant concentrations and activities were below RFCA Tier II soil ALs, except for one beryllium concentration, which was slightly above the RFCA Tier II soil AL (1.10 mg/kg vs 1.04 mg/kg). None of the results exceeded the WRW soil ALs (DOE 2003b).

IASAP Addendum #IA-02-07 (DOE 2002b) was prepared to describe confirmation sampling and analysis to support ER RSOP Notification #02-08 (DOE 2002c). Historical data (DOE 2002b) indicated that all contaminant concentrations and activities were less than RFCA Tier I soil ALs; most were less than Tier II soil ALs (DOE et al. 1996). The only WRW soil AL (DOE et al. 2003) exceedance was a subsurface arsenic concentration of 24.6 mg/kg; the AL is 22.2 mg/kg.

In addition, as part of accelerated actions for IHSSs 165 and 176, six surface soil samples were collected within IHSS 101 east of the SEP in accordance with IASAP Addendum #IA-03-02 (DOE 2002d). Samples were analyzed for metals. All concentrations were less than WRW soil ALs (DOE 2003c).

In addition, six surface soil samples were collected within IHSS 101 east of the SEP in accordance with IASAP Addendum #IA-03-02 (DOE 2002d). Samples were analyzed for metals. All concentrations were less than WRW soil ALs (DOE 2003c).

No Further Action Recommendation

After completion of accelerated actions, NFAA was recommended for IHSS 101 based on the following:

- Contaminant concentrations and activities were less than RFCA Tier II soil ALs, with the minor exceptions noted above. No Tier I soil ALs were exceeded.
- Results of the stewardship evaluation indicated additional action was not necessary.

After review of the Closeout Report for IHSS Group 000-1 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for the SEP Area of Concern (IHSS 101) on July 25, 2003 (CDPHE 2003a). Also, after review of the Data Summary Report for IHSS Group 000-1 (DOE 2003c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 101 on July 29, 2003 (CDPHE 2003b).

Comments

None

References

CDPHE, 2003a, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, and T. Rehder, US EPA Region 8, RE: Closeout Report for IHSS Group 000-1 Solar Evaporation Ponds Area of Concern, July 25.

CDPHE, 2003b, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, and T. Rehder, US EPA Region 8, RE: Data Summary Report for IHSS Group 000-1, July 29.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002a, RCRA Closure of the RFETS Solar Evaporation Ponds, Proposed Action Memorandum, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-08, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002c, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-07, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002d, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003c, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 000-121

IHSS Number: 121
Current Operable Unit: IA
Former Operable Unit: 9
IHSS Group: 000-2
Unit Name: Original Process Waste Lines (OPWL)

This Final Update to the HRR for PAC 000-121 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 121 is summarized in this update. The following HRR volumes contain IHSS 121 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to 1975

Historical Summary

The OPWL system was a network of underground pipelines and 62 tanks, in 40 tank locations, used to transport and temporarily store aqueous chemical and radioactive process wastes. The location of IHSS 121 is shown on Figure 14. Placed in service during 1952, with additions and repairs made to the system through 1975, the OPWL transported a variety of wastes, including acids, bases, solvents, radionuclides, metals, oils, PCBs, biohazards, paints and other chemicals (DOE 2005a). Numerous leaks are known or suspected to have occurred throughout the system, including those listed in RFCA Attachment 14 (DOE et al. 2003). Based on these leaks, the following PACs were identified:

- PAC 000-121 – Original Process Waste Lines (OPWL);
- PAC 000-162 – Radioactive Site 700 Area;
- PAC 100-602 – Building 123 Process Waste Line Break;
- PAC 700-123.2 – Valve Vault West of Building 707;
- PAC 700-127 – Low-Level Radioactive Waste Leak;
- PAC 700-147.1 – Process Waste Line Leaks; and
- PAC 700-149.1 – Effluent Lines.

Portions of the OPWL system and leaks are discussed in other PAC writeups and in closeout report. Characterization results and accelerated actions for specific portions of the OPWL system are presented the Closeout Report for IHSS Group 000-2 (DOE 2005a) as well as in individual closeout and data summary reports for the following IHSS Groups:

- IHSS Group 000-1 (DOE 2003a) approved by CDPHE (CDPHE and EPA 2003);
- IHSS Group 000-2 (DOE 2005a) approved by CDPHE (CDPHE 2005a);
- IHSS Group 100-1 (DOE 2004b) approved by CDPHE (CDPHE, 2004a)
- IHSS Group 100-4 (DOE 2003b) approved by CDPHE (CDPHE 2003a);
- IHSS Group 400-3 (DOE 2003c) approved by CDPHE (CDPHE 2003b);
- IHSS Group 400-8 (DOE 2004c) approved by CDPHE (CDPHE 2004b);
- IHSS Group 500-3 (DOE 2005b) approved by CDPHE (CDPHE 2005b);
- IHSS Group 700-2 (DOE 2005c) approved by CDPHE (CDPHE 2005c);
- IHSS Group 700-3 (DOE 2005d and 2005e) approved by CDPHE (CDPHE 2005d and 2005e);
- IHSS Group 700-4 (DOE 2004d) approved by CDPHE 2004c)
- IHSS Group 700-7 (DOE 2004e) approved by CDPHE (CDPHE 2004d);
- IHSS Group 800-1 (DOE 2004f) approved by CDPHE (CDPHE 2004e);
- IHSS Group 800-2 (DOE 2003d) approved by CDPHE (CDPHE 2003c)
- IHSS Group 800-3 (DOE 2005f) approved by CDPHE (CDPHE 2005f);
- IHSS Group 800-4 (DOE 2003e) approved by CDPHE (CDPHE 2003d)
- IHSS Group 800-5 (DOE 2004g) approved by CDPHE (CDPHE 2004f); and
- IHSS Group 800-6 (DOE 2003f) approved by CDPHE (CDPHE 2003e).
- IHSS Group NE-1 (B-Ponds (DOE 2005g, approved by EPA (EPA, 2005)

IHSS Investigations

The OPWL system was characterized extensively as part of the RFCA (DOE et al. 1996) accelerated actions conducted at IHSS Group 000-2 and other IHSS Groups listed above. Thirty-four sampling locations were characterized under IHSS Group 000-2 in accordance with IASAP Addendum #IA-03-11 (DOE 2003g), and 401 other sampling locations were characterized under other IHSS Groups in accordance with IHSS Group-specific IASAP Addenda listed in the Closeout Report for IHSS Group 000-2 (DOE 2005a). Sampling targets included known and suspected leaks along OPWL (DOE et al. 2003), OPWL tanks and valve pits, and major OPWL joints. In addition, to ensure comprehensive sampling coverage, line segments not sampled based on specific targets were sampled at 100-ft intervals. Samples were analyzed for radionuclides, metals, VOCs, SVOCs, nitrate/nitrite, PCBs, pesticides, herbicides, and/or miscellaneous other analytes depending on specific targets and related historical and process knowledge.

Based on characterization results, soil was removed from some areas under and adjacent to the OPWL system, and confirmation samples (74) were collected to ensure that residual activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). As described below, some areas were not remediated based on RFCA and the SSRS (DOE et al. 2003). There

are 11 sampling locations containing residual contaminants at activities and concentrations greater than RFCA WRW soil ALs in subsurface soil (DOE 2005a).

- BV38-002 – The benzo(a)pyrene concentration exceeds the WRW soil AL but at a depth below 6 inches from the ground surface (at 10 ft bgs).
- BW38-004, CI46-001, CJ46-DR01 and CF33-010 – The arsenic concentrations exceed the WRW soil AL but at depths below 6 inches from the ground surface (at 4.5, 3.5, 7.5 and 5.0 ft bgs, respectively).
- CG48-008 and CG46-009 – Americium-241 and plutonium-239/240 activities exceed the WRW soil AL but at depths greater than 6 ft below final grade.
- CH47-051, CJ46-000, CJ46-002 and CQ44-003 – Plutonium-239/240 activities exceed the WRW soil AL but at depths greater than 6 ft below final grade (at 10, 11, 11 and 12 ft bgs, respectively).

In addition, at sampling locations CJ48-000 and CJ48-001, arsenic concentrations (at 36.3 and 31.1 mg/kg, respectively) in surface soil exceed the WRW soil AL. Soil removal at these area was not required because the concentrations were less than RFCA Tier I soil ALs (DOE et al. 1996; DOE 2003a).

OPWL System Removal

Sitewide, approximately 17,000 ft of OPWL were excavated, and approximately 14,700 ft of OPWL were grouted and left in place (DOE 2005a). OPWL associated with buildings was dispositioned under other IHSS Group accelerated actions. The remainder were dispositioned as part of the IHSS Group 000-2 project in accordance with ER RSOP Notification #03-14 (DOE 2003h). Approximately 5,300 ft of OPWL were excavated and removed as part of the IHSS Group 000-2 accelerated action. All remaining OPWL are greater than 3 ft below final grade, and all remaining pipeline ends were grouted. All OPWL excavations were backfilled with clean onsite soil, regraded and revegetated.

All of the manways and valve pits (29 total) were completely removed as part of the IHSS Group 000-2 project (DOE 2005a). All OPWL tanks were removed prior to building demolition, during building demolition, or as part of an ER removal action, with two exceptions. Tanks 36 and 37 were sumps in the Building 771 Annex located 3.5 ft below final grade. These tanks were decontaminated, left in place, and backfilled with soil (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for IHSS 121 based on the following:

- All tanks, valve pits, and manways associated with the OPWL system were removed.
- More than 50 percent of the OPWL (approximately 17,000 ft) was removed.
- Remaining OPWL have been tapped, drained, and grouted, reducing potential future releases of contamination.
- Most residual activities and concentrations are less than RFCA WRW soil ALs. Nonradionuclide concentrations greater than WRW soil ALs occur at a depth greater than 6

inches bgs, except for the two arsenic concentrations noted above. Radionuclide activities greater than WRW soil ALs are less than 3 nCi/g and occur at a depth greater than 6 ft bgs.

- The OPWL "hot spots" beneath the Building 771/774 basements are in an area mapped as prone to landslides; however, regrading of the area has buried residual contamination to depths greater than 6 ft bgs. Additionally, regrading, compacting, and revegetating this area further reduced the likelihood of erosion in this area. Other areas of the Site containing OPWL are not prone to significant erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.
- OPWL system components removed and remaining, soil excavation boundaries, and residual contamination is presented on Figure 16 of the Closeout Report for IHSS Group 000-2 (DOE 2005a).

After review of the Closeout Report for IHSS Group 000-2, Original Process Waste Lines (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 121 on October 6 2005 (CDPHE 2005). Also, after review of other closeout and data summary reports by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for portions of IHSS 121 within other IHSS Groups as indicated below:

- Tank 40 within IHSS Group 800-6 on March 25, 2003 (DOE 2003f, CDPHE 2003a).
- OPWL within IHSS Group 100-4 on April 22, 2003 (DOE 2003b, CDPHE 2003b).
- Tanks 4, 5 and 6 within IHSS Group 400-3 on December 18, 2003 (DOE 2003c, CDPHE 2003c).
- Tanks 8, 12, 13, 14, 15, 16, 17, 36, and 37 within IHSS Group 700-4 on February 6, 2004 (DOE 2004d, CDPHE 2004a).
- OPWL within IHSS Group 800-1 on March 19, 2004 (DOE 2004f, CDPHE 2004b).
- Tank 40 within IHSS Group 400-8 on March 19, 2004 (DOE 2004e, CDPHE 2004c).

Comments

IHSS 121 includes PIC 50.

References

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CDPHE, 2003b, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Approval, Data Summary Report for IHSS Group 400-3 (Buildings 444, 447 et al.), March 19.

CDPHE, 2003c, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 800-2, July 16.

CDPHE, 2003d, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-4, May 15.

CDPHE, 2003e, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March 25.

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CDPHE, 2004c, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774), February 6.

CDPHE, 2004d, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-7 (B779) - Approval, October 1.

CDPHE, 2004e, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-1 (B865) - Approval, March 19.

CDPHE, 2004f, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 800-5 (B887 & B885), NFAA - Approval, June 21.

CDPHE, 2005a, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for IHSS Group 000-2, Original Process Waste Lines, PAC 000-121, IHSS Group 000-4, October 6.

CDPHE, 2005b, Correspondence to J. Rampe, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 500-3 (B559) - NFAA Approval, June 24.

CDPHE, 2005c, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Approval, Draft Closeout Report for IHSS Group 700-2 (UBC 707 - Plutonium Fabrication and Assembly, and UBC 731 - Building 707 Process Waste), February 2005, Rocky Flats Environmental Technology Site, Golden, Colorado, March 15.

CDPHE, 2005d, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3 Volume I (B701) - Approval, Rocky Flats Environmental Technology Site, Golden, Colorado, April 19.

CDPHE, 2005e, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume II, Rocky Flats Environmental Technology Site, Golden, Colorado, October ____.

CDPHE, 2005f, Correspondence to J. Rampe, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-3 (B883) - Approval, Rocky Flats Environmental Technology Site, Golden, Colorado, June 7.

CDPHE and EPA, 2003, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, and T. Rehder, EPA Region 8, RE: Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, July 25.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Closeout Report for IHSS Group 000-1 Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2003b, Closeout Report for IHSS Group 100-4 (UBC 123, IHSS 148, PAC 100-611 and 100-5 (PAC 100-609), Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003c, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2003d, Data Summary Report for IHSS Group 800-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003e, Final Closeout Report for IHSS Group 800-4 UBC 886 - Building 886 IHSS 164.2 - Radioactive Site #2, Building 886 Spill IHSS 000-121 - Building 828 Sump, Tanks, and OPWL, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003f, Final Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003g, Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003h, FY03 ER RSOP Notification #03-14 for IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 100-1 UBC 122 (Medical Facility) and IHSS 000-121 Tank T-1 (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004c, Closeout Report for IHSS Group 400-8 UBC 441, IHSS 400-122, and Portions of IHSS 000-121, including Tanks T-2 and T-3, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004d, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2004e, Closeout Report for IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004f, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004g, Data Summary Report IHSS Group 800-5 UBC 887 - Process and Sanitary Waste Tanks and PAC 800-177 - Building 885 Drum Storage, Rocky Flats Environmental Technology Site, Golden, July.

DOE, 2005a, Closeout Report for IHSS Group 000-2, Original Process Waste Lines, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005b, Closeout Report for IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005c Closeout Report for IHSS Group 700-2, UBC 731 – Building 707 Process Waste, and IHSS 121 – Building 731, Tanks 11 and 30, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2005d, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005e, Closeout Report for IHSS Group 700-3, Volume II, UBC 776, UBC 777, UBC 778, and Portion of IHSS 000-121, including Tank 18, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005f, Closeout Report for IHSS Group 800-3, UBC 883, PAC 800-1200, PAC 800-1201, and Portion of IHSS 000-121, including Tanks 25 and 26, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005g, Closeout Report for IHSS Group NE-1, Ponds B-1 (IHSS NE-142.5), B-2 (IHSS NE-142.6), B-3 (IHSS NE-142.6), Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Legare, DOE RFPO, from C. Mark Aquilar, EPA Region 8, RE: Closeout Report for IHSS Group NE-1, B-Ponds (B-1, B-2, and B-3), May.

PAC REFERENCE NUMBER: 000-162

IHSS Number: 162
Current Operable Unit: IA
Former Operable Unit: 14
IHSS Group: 000-2
Unit Name: Radioactive Site 700 Area

This Final Update to the HRR for PAC 000-162 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 162 is summarized in this update. The following HRR volume contains IHSS 162 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

Prior to 1974 to 1981

Historical Summary

IHSS 162 is located along Eighth Street and extends from the southern end of Building 771 to the northern end of Building 881. The location of IHSS 162 is shown on Figure 14.

Radioactivity was identified during groundwater monitoring activities in 1974. In response to this contamination, Eighth Street was paved over to prevent mobilization of the contamination (DOE 1992). In January 1981, an air sample collected during excavation activities at Eighth Street and Central Avenue yielded a long-lived alpha activity, indicating the presence of residual activity in the area (PIC 15) (DOE 1992).

No releases occurring in IHSS 162 are documented. It is possible that the contamination detected in the IHSS is the result of releases in the surrounding IHSSs. There are at least 10 other IHSSs involving radioactive releases overlapping or in close proximity to IHSS 162 (DOE 1992).

OPWL lines within IHSS 162 include P-6, P-9, P-11, P-12, P-13, P-15, and short segments of P-4, P-10, P-16, and P-51. All OPWLs within IHSS 162 were grouted and left in place, with the exception of short segments of P-4, P-10, and P-51, which were removed in a RFCA (DOE et al. 1996) accelerated actions implemented in accordance with ER RSOP Notification #03-14 (DOE 2003, 2005a).

There are five OPWL lines that run within IHSS 162, including P-6, P-9, P-11, P-12 and P-13 (DOE 2005a). There are two known leaks that have occurred along these lines (one along P-6 and P-9 and one along P-12 and P-13.) All five lines were removed during the IHSS Group 000-2 RFCA (DOE et al. 1996) accelerated actions.

IHSS Investigations

HPGe survey data collected along the length of IHSS 162 during RFI/RI activities in the early 1990s did not indicate elevated activities in southern portion of the IHSS (DOE 1995). HPGe survey data at northern locations indicated elevated activities for thorium-232, uranium-238,

americium-241, and plutonium-239/240. The proximity to Building 569 and other IHSSs, including 150.2(S), may have influenced the measurements.

Twenty-three surface soil samples were collected in and around IHSS 162 as part of the OU 14 RFI/RI (DOE 1995). Organics, inorganics, and radionuclides were detected; however, all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2000 and 2005a; DOE et al. 2003).

IHSS 162 was characterized as part of accelerated actions in accordance with IASAP Addenda #IA-03-04 (IHSS Group 700-3) (DOE 2003a), #IA-03-11 (IHSS Group 000-2/OPWL) (DOE 2003b), and #IA-04-02 (IHSS Group 700-2) (DOE 2003c). Seventeen subsurface soil samples were collected along the length of the lines. Six of the samples were collected as part of IHSS Group 700-3 and analyzed for radionuclides, metals and VOCs (DOE 2005b). Two of the samples were collected as part of IHSS Group 700-2 and analyzed for radionuclides, metals, VOCs and SVOCs (DOE 2005c). Nine of the samples were collected as part of IHSS Group 000-2 (OPWL) and analyzed for radionuclides, metals, VOCs and SVOCs (DOE 2005a). All contaminant activities and concentrations were less than RFCA WRW soil ALs.

No Further Action Recommendation

NFAA was recommended for IHSS 162 based on the following:

- All contaminant activities and concentrations were less than RFCA WRW soil ALs.
- Results of the SSRS indicated that additional action was not necessary. The IHSS is not in an area susceptible to high erosion.
- Results of the stewardship evaluation indicated that additional action was not necessary.

After review of the Closeout Report for IHSS Group 700-2 (DOE 2005c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for the portion of IHSS 162 within IHSS 700-2 on March 15, 2005 (CDPHE 2005a). Also, after review of the Closeout Report for IHSS Group 700-3 (DOE 2005b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 162 on October __, 2005 (CDPHE 2005b). In addition, after review of the Closeout Report for IHSS Group 000-2 (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 162 on October 6, 2005 (CDPHE 2005c).

Comments

IHSS 162 includes PIC 15.

References

CDPHE, 2005a, Correspondence to J. Legare, DOE RFPO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, March 15.

CDPHE, 2005b, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for, IHSS Group 700-3, Rocky Flats Environmental Technology Site, Golden, Colorado October __.

CDPHE, 2005c, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, October 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Data Summary 1, Operable Unit 14, Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Final Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, September .

DOE, 2003c, Industrial Area Sampling and Analysis Plan FY04 Addendum #IA-04-02, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005a, Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), RFETS, Golden, Colorado, October.

DOE, 2005b, Closeout Report for the IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005c, Closeout Report for the IHSS Group 700-3, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005d, Closeout Report for the IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 000-168

IHSS Number: 168
Current Operable Unit: 11
Former Operable Unit: 11
IHSS Group: Not Applicable
Unit Name: West Spray Field

This Final Update to the HRR for PAC 000-168 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 168 is summarized in this update. The following HRR volumes contain IHSS 168 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1996 Annual (DOE 1996).

Dates(s) of Operation or Occurrence

April 1982 through October 1985

Historical Summary

The location for IHSS 168 is shown on Figure 14. The West Spray Field was used for the periodic spray application of excess water pumped from SEP Ponds 207B North and 207B Center. When the storage capacity of these ponds was reached, the liquids were pumped to the West Spray Field via an aboveground pipeline for spray application. The sources of wastewater stored in the SEP and sprayed at IHSS 168 included treated sanitary wastewater from the Sewage Treatment Plant and groundwater collected in the interceptor trench system north of Building 771. Approximately 66 million gallons from the SEP were sprayed at IHSS 168 (DOE 1992).

The pond liquids applied to the West Spray Field contained high nitrate concentrations, elevated levels of radionuclides, trace levels of VOCs and SVOCs, and metals (DOE 1991a).

IHSS Investigations

A CEARP initiated in 1986 identified IHSS 168 as a SWMU. IAG negotiations held in 1991 changed the designation from SWMU to IHSS and initiated the investigatory program for OU 11 (which is comprised solely of IHSS 168) to evaluate potential contamination within the IHSS. The Final Phase I RFI/RI Work Plan (DOE 1991b) was completed in 1992; the Final Combined Phases RFI/RI Report (DOE 1995a) was completed in June 1995 and the CAD/ROD (DOE 1995b) was approved in October 1995. IHSS 168 was classified as a low-hazard site, requiring No Action under a residential-use scenario.

Plutonium-239/240, americium-241, tritium, and nitrate/nitrite were the only constituents identified during the field sampling in 1994 that were considered PCOCs. Americium-241 and plutonium-239/240, identified in surficial soils at maximum activities of 0.43 and 2.2 pCi/g respectively, have exhibited little migration since spray activities ceased in 1985. Most of the nitrate/nitrite, found at maximum concentrations of 37 mg/kg in surficial soil, appeared to have

been taken up as a nutrient by indigenous plants. Tritium, as tritiated water, behaved similarly to regular water and was detected at levels above background (maximum 3.4 pCi/g) in OU 11 groundwater. Analysis of the fate and transport characteristics of the PCOCs did not indicate a potential for any changes to the current conditions. The potential for off-site migration of PCOCs was assessed to be extremely limited (DOE 1995b).

No Further Action Recommendation

The CDPHE risk-based conservative screen was performed on the OU 11 soil PCOCs, using data from the surface to a depth of 12 ft. No PCOCs were identified in OU 11 groundwater samples. The total SORs for OU 11 were less than 1, indicating a low-hazard source area. An evaluation of dermal contact for PCOCs in OU 11 surficial soil confirmed this assessment (DOE 1995a).

In addition, the screening-level ERA concluded that past operations at OU 11 had no significant adverse ecological effects. No negative effects to critical habitats, wetlands, or endangered species were identified. Trends in the ecological data were consistent with effects of supplemental watering and fertilizing in semiarid grassland. While this may have increased biomass and litter, the effects were not detrimental to the grassland ecosystem (DOE 1995b).

Based on information presented in the Final OU 11 Combined Phases RFI/RI Report (DOE 1995a), a CAD/ROD recommending No Action under CERCLA and Clean Closure under RCRA was prepared (DOE 1995b). The CAD/ROD, and IHSS 168s No Action status, was approved on September 21, 1995 (DOE et al. 1995).

Comments

CERCLA Five Year Review: The CAD/ROD for OU 11 (DOE 1995b) indicates that a five-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

DOE, 1991a, Draft Phase I RFI/RI Work Plan for the Solar Ponds (OU 4), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1991b, Draft Phase I RFI/RI Work Plan for the West Spray Field (OU 11), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995a, Operable Unit 11 Final Combined Phases RFI/RI Report, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1995b, Final Corrective Action Decision/Record of Decision for OU11: West Spray Field, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, EPA, and CDPHE, 1995, Corrective Action Decision/Record of Decision Declaration, Rocky Flats Environmental Technology Site Operable Unit 11: West Spray Field, Jefferson County, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 000-172

IHSS Number: 172
Current Operable Unit: IA
Former Operable Unit: 8
IHSS Group: Not Applicable
Unit Name: Central Avenue Waste Spill

This Final Update to the HRR for PAC 000-172 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 172 is summarized in this update. The following HRR volumes contain IHSS 172 information:

Original Report – 1992 (DOE 1992);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

June 11, 1968

Historical Summary

The location for IHSS 172 is shown on Figure 14. A drum being transported from the 903 Drum Storage Area to Building 774 leaked, causing contamination to the roadways. Four 55-gallon drums, one empty and three containing liquid waste material, were transported by forklift truck from the 903 Drum Storage Area to Central Avenue, west to Sixth Street, and north to Building 774, a distance of about 1.3 miles. The drums were checked for integrity prior to movement and at the off-loading point. The latter examination revealed that some liquid dripped from the bung hole of one drum during transit. Apparently the plastic spigot on one of the full drums had been unknowingly damaged during movement. This damage allowed the contaminated solution to drip onto the roads traveled. Only the west and northbound lanes were affected (DOE 1992).

The drum leaked contaminated material at a rate of about one drop every 3 ft the length of Central Avenue to Sixth Street and down Sixth Street to Building 774. Roadway alpha radioactivity contamination was measured up to 100,000 cpm. One reference states that the incident resulted in radioactive contamination of approximately 140,000 dpm/cm² on the west bound lane of Central Avenue and along Sixth Street. In addition, a 500 ft² area north of the west dock of Building 774 was contaminated to a level of 50,000 cpm (PAC 700-1114a and 700-1114b). The forklift was contaminated to a level of 100,000 cpm (DOE 1992).

Discrepancies in information were found regarding the actual composition of the liquid waste material. The descriptions include contaminated perclene solution, contaminated waste solvent, solvent, rinse, contaminated material, contaminated oil, contaminated wash solution, plutonium-contaminated oils, and oils with lathe coolant (consisting of 70 percent oil and 30 percent carbon tetrachloride), radioactive waste oil, and uranium oil (DOE 1992).

The contaminated areas of the road were promptly barricaded. The route of the forklift truck was examined and monitored disclosing small spots of contaminated drippings on the road. Contaminated areas of the road were cleaned up. Some fixed contamination still remained after washing (DOE 1992). Following cleanup activities, the affected roadway was sealcoated. (DOE 1992). The forklift truck was decontaminated and released. Vehicles that had been on the road during the interval between movement of the drums and discovery of the leakage were surveyed and no contamination was detected (DOE 1992). Four barrels of contaminated soil were removed from the contaminated 500 ft² area north of the west dock of Building 774 (DOE 1992).

In July 1970, as an unrelated project, a section of asphalt between Eighth and Tenth Streets on Central Avenue was replaced. The old asphalt was monitored before and after removal with negative results. This monitoring was performed, in part, as a response to this incident (DOE 1992).

IHSS Investigations

Assessment of contamination associated with IHSS 172 was initiated in accordance with the OU 8 RFI/RI Work Plan (DOE 1994a) and recommendations presented in the OU 8 Technical Memorandum (DOE 1994b). The OU 8 Technical Memorandum included the results of data compilation efforts to establish the paving history of the IHSS and an assessment of any significant realignment of the roadways or drainage ditches within the IHSS. The purpose of this exercise was to identify areas of contamination that had been mitigated by implementation of routine construction activities and paving. This information was then used to focus the data needs associated with IHSS 172 characterization. It was concluded that residual contamination resulting from this release, if present, would likely be confined to the immediate vicinity of the roadway and unloading points. This conclusion took into account the small quantities of material believed to have been released (that is, less than 10 gallons) and cleanup efforts undertaken at the time of this incident (DOE 1994b).

Based on the results of the data compilation, the recommended sampling for IHSS 172 included collection of three asphalt samples (one near the intersection of Central Avenue and Sixth Street and two in the Central Avenue portion of the IHSS near the 903 Pad), one surface soil sample (at the Building 774 dock area), and one vertical soil profile sample (in the northeast bound portion of Sixth Street, southeast of Building 371) (DOE 1994b). The results are presented in the OU 8 Data Summary Report (DOE 1995). With the exception of low levels (that is, estimated concentrations less than the method detection limit) of SVOCs, americium-241, plutonium-239/240, and sodium were the only PCOCs detected at concentrations (activities) slightly above background in the surface soil sample (DOE 1995). The only contaminant detected above background in the vertical soil profile sample was uranium-235. The uranium-235 activity was detected slightly above background in the vertical profile sample from the 4- to 6-inch interval. Sodium was eliminated as a PCOC because it is an essential nutrient. Analytical results for these PCOCs are summarized in Table 1 of the 1998 Annual Update to the HRR (DOE 1998).

No Further Action Recommendation

IHSS 172 was proposed for NFA status in the 1998 Annual Update to the HRR (DOE 1998) for the following reasons:

- The chemicals detected are significantly different between the sampling locations, indicating that a distinguishable source of contamination associated with the release cannot be identified.
- Analytical data for the surficial soils/asphalt collected show that the contaminants associated with IHSS 172 are orders of magnitude below RFCA Tier II surface soil ALs (DOE et al. 1996).
- A preliminary estimate of the Risk Based Ratio Sum, which is used in the CDPHE Conservative Screen, is 0.12 and includes both the radionuclides and organics detected. For radionuclides only, the sum is equal to 0.009.

After review of the 1998 Annual Update to the HRR by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFA status for IHSS 172 on July 9, 1999 (CDPHE 1999).

Comments

None

References

CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Annual update for the Historical Release Report (September 1998), July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994a, Operable Unit 8 Phase I RCRA Facility Investigation/Remedial Investigation Work Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1994b, Operable Unit No. 8, Technical Memorandum No. 1, Investigations of Foundation Drains and Other Data Compilation, Addendum to the Operable Unit 8 Work Plan, Rocky Flats Environmental Technology Site, 700 Area (Operable Unit No. 8), RFP/ERM-TM1-94-00011, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1995, Operable Unit 8, Data Summary Report, 700 Area, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, EPA, CDPHE, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 000-190

IHSS Number: 190
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 000-3
Unit Name: Caustic Leak (also referred to as Central Avenue Ditch)

This Final Update to the HRR for PAC 000-190 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 190 is summarized in this update. The following HRR volumes contain IHSS information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

December 3 and 4, 1978, and January 6, 1989

Historical Summary

The location for IHSS 190 is shown on Figure 14. On December 3 and 4, 1978, a Building 443 bulk caustic storage tank leaked into its spill catch basin. A sodium hydroxide (NaOH) solution was released from the catch basin to the Central Avenue Ditch. The NaOH solution flowed eastward down the Central Avenue Ditch and was diverted to South Walnut Creek and Pond B-1. Approximately 1,000 to 1,500 gallons of 2.5 Normal NaOH was released (DOE 1992).

Immediate steps were taken to isolate the contamination, treat the contaminated runoff, and divert drainage from adjacent areas. These steps included the following (DOE 1992):

- Diverted the 400 Area snowmelt water across Central Avenue Ditch to the 700 Area drainage;
- Dammed the upper Central Avenue Ditch above the B-Series ponds near the cattle fence;
- Diverted Building 995 sewage effluent to SEP Pond 207B-South and retain Pond B-3 as a reserve pond;
- Roped off the upper portion of the Central Avenue Ditch;
- Pumped water from Pond B-2 to Pond A-2 and hold Pond B-2 as a last resort catch pond; and
- Neutralized Pond B-1 by adding 1,400 lb of alum and then pump this liquid to SEP Pond 207B-North.

Followup response activities to the December 1978 incident included (DOE 1992):

- Neutralized the Central Avenue Ditch water between Fifth and Tenth Streets by adding 5,000 lb of alum;
- Completed final sampling of SEP Pond 207B-North in January 19, 1979;

- Monitored the pH of the ditch. On March 23, 1979, the ditch was considered to be no longer a problem and runoff from the ditch was allowed to be discharged offsite;
- Drained SEP 207B-North liquid into Pond B-2 in May 1979; and
- Sprayed the remaining liquid in Pond B-1 on the adjacent hillside in June 1979.

On January 6, 1989, caustic solution was released from the same Building 443 tank into its secondary containment (spill catch basin). This release occurred because the outlet pipe and valve on the tank deteriorated to the extent that the pipe disconnected from the tank. Because of cold weather the caustic froze, preventing further leakage from the tank. Approximately 1 to 3 gallons of concentrated NaOH was released (DOE 1992).

The tank was temporarily re-piped and emptied. The removed caustic was neutralized and transferred to Building 374 for treatment as a process waste (DOE 1992). The tank leak was identified and all repairs were completed (DOE 1992). The tank and Building 443 were removed in 2004 (DOE 2004b).

IHSS Investigations

No additional investigation was warranted.

No Further Action Recommendation

IHSS 190 was proposed for NFAA status in the 2004 Annual Update to the HRR for the following reasons:

- Sodium (from the neutralization process) is considered a common essential nutrient.
- The maximum aluminum concentration in surface soil samples within and directly adjacent to IHSS 190 is 23,000 mg/kg, an order of magnitude less than the WRW soil AL (DOE et al. 2003) for aluminum.
- Water was adequately neutralized with alum shortly after the spill event.
- The 1978 release occurred more than 25 years ago, a time frame over which a significant quantity of water has flowed through the ditch, thereby further neutralizing/diluting the original NaOH release.

After review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 190 on July 9, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval: No Further Accelerated Action (NFAA), PAC 000-190, Caustic Leak, Colorado, July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Close-out Report for Building 443 Steam Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 000-192

IHSS Number: 192
Current Operable Unit: IA
Former Operable Unit: 16
IHSS Group: Not Applicable
Unit Name: Antifreeze Discharge

This Final Update to the HRR for PAC 000-192 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of IHSS 192 is summarized in this update. The following HRR volumes contain IHSS 192 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1996 Annual (DOE 1996).

Dates(s) of Operation or Occurrence

December 2 or 3, 1980

Historical Summary

The location for IHSS 192 is shown on Figure 14. Approximately 155 gallons of antifreeze solution were discharged from a brine chiller unit evaporator into a floor drain in Building 708 (DOE 1992a, 1992b). The floor drain discharged into a buried culvert south of the building. The buried culvert ran east from Building 708 under the Building 750 parking lot and terminated at an open culvert just east of Tenth Street. This storm-runoff collection system discharged from the culvert into South Walnut Creek. The antifreeze solution contained 25 percent ethylene glycol in water (DOE 1992a, 1992b).

The flow was contained by diverting the storm water discharge into retention Pond B-1. The Pond B-5 dam was closed and there was no off-site discharge of the liquid. Following the release, 5,000 gallons of water were flushed through the drainage system into Pond B-1. Based on visual observations of color and flow, it was believed that the entire spill was contained in Pond B-1 (DOE 1992a, 1992b).

IHSS Investigations

Although no direct documentation was found that detailed the fate of the ethylene glycol, it is highly unlikely that any of this chemical remains in the environment from this release. As described in the Final NFA Justification Documentation for Operable Unit 16, Low-Priority Sites (DOE 1992b), ethylene glycol (250,000 ppm in antifreeze) would degrade to less than 7 ppm in approximately 20 to 40 days at surface conditions. In addition, the degradation of ethylene glycol in multi-media environments was modeled and the results demonstrated that the concentration of ethylene glycol in leachate would decrease to less than 1 part per billion (ppb) in 4 days. Because the degradation models predicted that no ethylene glycol would be detected in leachate or soil less than 1 week following the spill, the source would have been completely degraded in the time elapsing since 1980. Without a source, there is no risk to human health or the environment (DOE 1994).

No Further Action Recommendation

The Final NFA Justification Document for Operable Unit 16, Low-Priority Sites (DOE 1992b) provided information to show that it is highly unlikely that ethylene glycol from the IHSS 192 release remains in the environment. A No Action remedy for IHSS 192 was proposed (DOE 1992b) and the CAD/ROD approved on October 28, 1994 (DOE 1994).

Comments

CERCLA Five-Year Review: The CAD/ROD for OU 16 (DOE et al. 1994) indicates that a five-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Corrective Action Decision/Record of Decision for OU16: Low Priority Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 000-500

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 000-3
Unit Name: Sanitary Sewer System

This Final Update to the HRR for PAC 000-500 consolidates the information in the initial 1992 HRR with information gained through the disposition of this PAC, which was conducted in accordance with the RFCA accelerated action process. The disposition of PAC 000-500 is summarized in this update. The following HRR volume contains PAC 000-500 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1952 to 2004

Historical Summary

The RFETS sanitary sewer system was used for transport, storage, and treatment of sanitary waste since the Plant began operations in 1952. Various drains, sinks, sumps, and toilets located in buildings discharged to central collection lines which transported the waste to the Sanitary Sewage Treatment Plant (Building 995). Wastes which were incompatible with sanitary sewage treatment were designated process wastes and were handled in a separate system from sanitary wastes (PAC 000-121, OPWL, and PAC 000-504, NPWL). In each building which generated process waste, waste discharge points (drains, sinks, sumps, etc.) were designated as either sanitary waste or process waste receptacles, and were plumbed separately into the appropriate waste system. In some plant facilities, wastes were, or had historically been, collected and temporarily stored in tanks plumbed into both systems, and transferred to the appropriate system based on analytical results (DOE 1992). The location of PAC 000-500 is shown on Figure 13.

Early in the Site history, some stormwater sources, such as some roof drains, were connected to the sanitary sewer system. These were previously disconnected, except at Manhole 3 north of Building 771 where a storm sewer drained into the sanitary system. In addition, cooling tower sumps were generally pumped into the sanitary sewer system to dispose of cooling tower blowdown water. These were disconnected as the cooling towers were decommissioned (DOE 2004).

The sanitary sewer collection system flowed by gravity from west to east across the IA. However, some facilities, such as the Building 881 and Building 771 clusters, also had lift stations to pump sewage where gravity flow was not possible. There were two sections of the sanitary sewer system: the northern section collected flow from the Plant area formerly located within the PA and the 371 trailers, Building 116 and Trailer T117A; the southern section collected flow from the rest of the Plant exterior to the PA. The two sections joined at Building 990 (DOE 2004).

From Building 990, wastewater flowed into one of three 110,000-gallon influent storage tanks at the Waste Water Treatment Facility (WWTF) allowing inflow to be collected while another tank holding the previous day's flow was processed. In 2003, normal flows were approximately 0.16 million gallons per day (MGD). The flow rate declined as the Site closed until the system was taken out of service in October 2004 (DOE 2004).

Prior to closure, the estimated total length of the sanitary sewer lines was approximately 67,000 feet, including both active and abandoned lines. The diameter of the lines ranged from 3 to 12 inches with about 30,000 ft of 6-inch and larger lines and about 11,500 ft of 4-inch lines. In 1985, some of the system was repaired to reduce infiltration and leaking. Many of these abandoned lines are believed to have been flushed, plugged, or removed. The more recent abandoned lines and the active lines in 2004 were flushed and plugged as part of the closure activities. Only a small fraction of the lines could not be located in the field (DOE 2004).

Sanitary sewer lines were generally greater than 3 ft below grade, with the exception of the lines in the 371 trailer complex and on the northeastern side of Building 371, and the line that ran east-west across the parking lot on the south side of the building. Lines associated with buildings were occasionally less than 3 ft below grade under or adjacent to the building because the system relied on gravity flow, and shallower lines were required for flow from the buildings into the main lines (DOE 2004).

In addition to the main sanitary sewer system, sanitary waste digestion systems were installed at the East and West Guard Posts when the posts were constructed in the mid 1980s. These systems did not work well and were replaced in the early 1990s by vaults that were pumped out regularly. The pumps were removed when the guard posts were removed (as Type 1 facilities) in the early 2000s.

Discharges to the Sanitary Sewer System

In the past, some nondomestic wastes were discharged into the sanitary sewer system, including laundry water, laboratory wastes, treated process waste effluents, photographic processing wastes, miscellaneous waste chemicals, and other waste streams. These discharges changed over time in response to internal guidelines and to State and Federal regulations. Much of the potential contaminants discharged to the sanitary sewer system were derived from laundry waste. A 1967 survey indicated that of the average daily flow of 250,000 gallons, 21,000 gallons were laundry waste. A 1973 investigation of plutonium releases to the sanitary sewer system indicated that 88 percent of the plutonium in the sanitary sewer system at that time originated from the laundries on Site. This primary source of contaminated discharges was eliminated when potentially contaminated laundry was sent off site in 1996. Known discharges of nonsanitary waste are listed in the NFAA Justification for Sanitary Sewer System (DOE 2005a).

Releases from the Sanitary Sewer System

Treated effluent from Building 995 was discharged to Pond B-3 (PAC NE-142.7). Sanitary sewer system sludge containing low levels of radionuclides was originally disposed of on site in burial trenches (Trenches T-2 through T-11 [PACs NE-110, 900-109, and NE-111.1 through 111.8]). Later, the sludge was disposed off site as waste.

The available information on other releases from the sanitary sewer system is summarized in other PAC narratives (DOE 1992). PAC 700-144 (Sewer Line Break) and PAC 800-145 (Sanitary Waste Line) target releases from sanitary sewer lines that handled laundry water

containing low concentrations of radionuclides. PAC 900-141 (Sludge Dispersal) addresses wind dispersion of radioactively contaminated sanitary system sludges from drying beds near Building 995. PAC 100-604 (T130 Complex Sewer Line Breaks) targets sanitary sewer line leaks in 1990 at the T130 office trailer complex.

Sanitary Sewer System Closure

Closure of the sanitary sewer system was completed in early 2005 (DOE 2005b). Closure was conducted in accordance with the Technical Memorandum – Closure Strategy for the Rocky Flats Environmental Technology Site Sanitary Sewer System (DOE 2004). Closure activities associated with the system were performed as a BMP, or were part of the building Decontamination and Decommissioning (D&D) Program. Specific releases to or from the sanitary sewer system that are designated PACs were closed with regulatory agency approval (see PAC writeups).

Sewer lines within 3 ft of the surface, including lines within 3 ft of the surface beneath building slabs on grade, were flushed and removed. The ends of remaining lines were grouted. Equipment in lift stations was removed. In most cases, manholes and lift stations were removed to 3 ft below final grade, pipe ends were surveyed and plugged, and remaining bottoms of manholes and lift stations were grouted; however, some manholes and lift stations were completely removed. Pipe bedding material was disrupted at strategic locations. Disruption of the utility trenches associated with the sanitary sewer system occurred at two places to further reduce east west flow of groundwater through or around the sanitary sewer lines (DOE 2005a):

- 700 Area where the alluvium thins over an apparent bedrock high; and
- 800 Area north of former Buildings 865 and 886 along Central Avenue.

Other areas that were disrupted as part of Site closure that also act to reduce the flow of groundwater are (DOE 2005a):

- South of Building 881 where the sanitary sewer lift station was removed and backfilled.
- West of the WWTF where sanitary sewer lines were removed, the bedding material disrupted and the excavations backfilled.
- North of Building 771 where the sanitary sewer lift station was abandoned in place and the area was backfilled, reducing the potential for groundwater to reach surface water.
- South and west of Building 371 where a segment of the sanitary sewer line was removed during the land reconfiguration activities, significantly reducing the potential for groundwater collection in the sanitary sewer.

During removal of sewer lines, the abandoned sewer line on the northern side of the street at 8th Street and Central Avenue was found. The pipe was asbestos-containing concrete.

PAC Investigations

In consultation with CDPHE, eight grab samples of solids within the sewer pipes were collected to determine if additional BMPs were recommended beyond those generally described in the Closure Strategy (DOE 2004). These samples were analyzed for metals and radionuclides, and activities and concentration were compared to WRW soil ALs (DOE et. al 2003). Although the waste in the sewer lines is not soil, the comparison was made to the WRW soil ALs because of

the potential for the material to impact surface water. Only two locations had waste solids where contaminant activities and concentrations were greater than the WRW soil ALs (DOE 2005a). Arsenic (26.0 mg/kg) exceeded the WRW soil AL (22.2 mg/kg) at the Building 771 lift station, and chromium (1,300 mg/kg) and uranium-235 (9.8 pCi/g) exceeded the WRW soil ALs of 268 mg/kg and 8 pCi/g, respectively, at the Building 881 lift station. However, additional BMPs were not considered at these locations, because there is no pathway to surface water at the B771 lift station and the B881 lift station was removed. Also, contaminant activities and concentrations in surface soil south of Building 881 were less than WRW soil ALs (DOE 2005a).

No Further Action Recommendation

PAC 000-500 was proposed for NFAA in March 2005 (DOE 2005a) for the following reasons:

- All of the major contaminant discharges to the sewer system happened prior to 1990. Significant quantities of sewage have been discharged through these lines since then, which has served to flush the lines. Additional flushing (jetting) of the main lines served to further eliminate significant solids. Sample results show that remaining solids are below WRW ALs.
- Infiltration and inflow studies indicated water was more likely to leak into the system than out. Therefore, significant contamination surrounding the sewer lines is unlikely.
- Shallow sanitary sewer lines and components were removed to a depth of 3 ft below final grade, and the closure of deeper lines, trunk lines, manholes, and lift stations by grouting, as well as the disruption of some utility trenches, have effectively disrupted contaminant pathways to surface water from the sanitary sewer.
- Results of the SSRS indicated additional action was not necessary. Residual contamination is not susceptible to significant erosion.

After review of the NFAA Justification for Sanitary Sewer System (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 000-500 on March 21, 2005 (CDPHE 2005).

Comments

PAC 000-500 includes PIC 17.

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: No Further Accelerated Action (NFAA) Request for the Sanitary Sewer System, PAC 000-500, part of IHSS Group 000-3, March 21.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2004, Technical Memorandum – Closure Strategy for the Rocky Flats Environmental Technology Site Sanitary Sewer System, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005a, No Further Accelerated Action Justification for Sanitary Sewer System, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2005b, Closeout Report for 995 Complex and Sanitary Sewer System, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 000-501

IHSS Number: Not Applicable
Current Operable Unit: BZ
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Roadway Spraying

This Final Update to the HRR for PAC 000-501 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 000-501 is summarized in this update. The following HRR volumes contain PAC 000-501 information:

Original Report – 1992 (DOE 1992);
Update Report – Fourth Quarterly (DOE 1993);
Update Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

January 1974 to September 1983

Historical Summary

The location for PAC 000-501 is shown on Figure 14. Roadway spraying primarily involved waste oils used as a dust suppressant, but also included occurrences involving reverse osmosis brine solutions and footing drain water containing rhodamine WT dye. Roadway spraying is briefly described below:

- In January 1974, two roads near the 903 Pad (IHSS 112) needed to be oiled as soon as possible to suppress re-suspension of contaminants. The roadways were inside the perimeter fence from Central Avenue south and west to a point due south of the western edge of the 903 Pad and outside the perimeter fence, from Central Avenue south to Pond C-1 (DOE 1992).
- Starting in April, 1977, waste motor oil, drained from plant vehicles was used on the main roads and construction areas around Building 371. Motor oil use near streams or other drainages was avoided until evidence could be provided to show that there was no pollution of drinking water systems (DOE 1992).
- In May 1981, waste oil on-hand from equipment used in non-plutonium and non-uranium areas was applied to the landfill access road (DOE 1992).
- In October 1982, 120 liters of Number 2 diesel fuel from a tank spill on the northern side of Building 371 was used on roads, and is discussed in detail in the write-up for PAC 300-151 (DOE 1992).
- In September 1983, 1,200 gallons of Mobil Number 634 gear lubrication oil from a Building 883 rolling mill lube system was used on Plant gravel roads (DOE 1992).

- In early June 1979, Building 371 footing drain water containing 800 ppb rhodamine WT dye was distributed on BZ roads (DOE 1992). This solution was the result of a preoperational footing drain tracer test at Building 371 (see also PACs NE-142.1 - 142.4 and PAC 000-500).
- From June 1979 through approximately fall 1979, high salt content liquid from the reverse osmosis facility, Building 910, was sprayed on approximately 7.6 miles of BZ dirt roads. Each truck load of the brine solution was to be analyzed for gross alpha activity, gross beta activity, and total dissolved solids. If gross alpha activity exceeded 40 pCi/L and/or gross beta activity exceeded 50 pCi/L, operations ceased. One reference noted that beta activity of approximately 150 pCi/L had been measured in brine from the reverse osmosis process (DOE 1992).

PAC Investigations

No additional investigation deemed necessary because NFA was granted based on existing data.

No Further Action Recommendation

PAC 000-501 was addressed through the consultative process in NFA Working Group meetings on November 14, 2001, and December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the December 19, 2001, meeting and was formally approved by EPA (the LRA) and CDPHE in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

The entire PAC is categorized in RFCA as part of the BZ OU, but the portion of PAC 000-501 comprised of the roadway that surrounded Building 371 is geographically in the IA OU.

Roadway Spraying is the original PAC 000-501 as designated in the original HRR. The PAC 000-501 designation was mistakenly re-assigned to the Asphalt Surface in Lay-down Yard North of Building 130 (now PAC 100-613) in the Fourth Quarterly Update to the HRR. This mistake was corrected in the Seventh Quarterly Update to the HRR which redesignated the Asphalt Surface in Lay-down Yard North of Building 130 as PAC 100-613. As reflected in this write-up, PAC 000-501 continues to be Roadway Spraying.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1993, Fourth Quarterly Update for Historical Release Report, April 1, 1993 to July 1, 1993, Rocky Flats Plant, Golden, Colorado, July.

DOE, 1994, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 2002, Annual Update for Historical Release Report, Rocky Flats Plant, Golden, Colorado, September.

PAC REFERENCE NUMBER: 000-502

IHSS Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: ITS Water Spill

This Final Update to the HRR for PAC 000-502 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 000-502 is summarized in this update. The following HRR volumes contain PAC000-502 information:

Update Report – Second Quarterly (DOE 1993); and
Update Report – Seventh Quarterly (DOE 1994).

Note: The ITS Water Spill was designated as PAC 000-502 in the Second Quarterly Update to the HRR (DOE 1993) but was re-assigned as PAC 900-1310 in the Seventh Quarterly Update to the HRR (DOE 1994). The number 000-502 is no longer in use. Refer to the write-up for PAC 900-1310.

Dates(s) of Operation or Occurrence

Not Applicable

Historical Summary

Not Applicable

PAC Investigations

Not Applicable

No Further Action Recommendation

Not Applicable

Comments

None

References

DOE, 1993, Second Quarterly Update for Historical Release Report, October 1, 1992 to January 1, 1993, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1994, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

PAC REFERENCE NUMBER: 000-503

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Solar Pond Water Spill Along Central Avenue

This Final Update to the HRR for PAC 000-503 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 000-503 is summarized in this update. The following HRR volumes contain PAC 000-503 information:

Update Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

September 30, 1994

Historical Summary

The location for PAC 000-503 is shown on Figure 14. A tanker truck was transporting SEP Pond 207B water from the 750 Pad to Building 374 feed storage tanks (Tanks 231A and 231B) with the top port of the tank inadvertently unlatched. When the truck stopped at a sign, the top jarred open. During continued transport, the water sloshed out of the port onto the asphalt road surface for approximately 1 1/2 miles. An employee witnessed the spill, followed the tanker to Building 374, and notified the trucker of the incident (DOE 1994).

The spill material appeared to have been fully contained on the asphalt road surface between the 750 Pad and the 231 Tanks. Liquid material along the 1 1/2 mile of affected asphalt was removed. No material was observed to have reached soil; thus, no threat to the environment was identified (DOE 1994).

Approximately 35 gallons of the SEP Pond 207B water spilled. As documented in the Waste Stream and Residue Identification and Characterization (WSRIC) manual for OU 4 operations, the EPA waste codes assigned to the SEP sludge and water included F001, F002, F003, F005, F006, F007, F009 and D006 (DOE 1994).

The affected area was cordoned off to prevent the spread of contamination. The RCRA Contingency Plan was implemented because of hazardous wastes documented in the SEP water. Samples of the material in the truck were collected and analyzed for pH and gross alpha. Upon determination that radioactivity levels were below background, a total of 55 gallons of free liquids were vacuumed from the roadway and placed in a container. This liquid included snowmelt from puddles as well as from the tanker. The recovered waste was transferred to the Building 374 Treatment Facility for treatment (DOE 1994).

PAC Investigations

The pH of the truck load was measured during the spill response and reported at a pH of 10. A radiological survey of the truck and puddles on the roadway showed gross alpha at 1,150 pCi/L,

a value below background concentrations. Analysis for selected metals was also performed on both the water in the truck and the recovered material, which was believed to be diluted with snow-melt. Results for these analyses are tabulated and compared to SEP 207 A/B pond wastewater characterization data in the Seventh Quarterly Update to the HRR (DOE 1994).

No Further Action Recommendation

PAC 000-503 was addressed through the consultative process in an NFA Working Group meeting on January 31, 2002. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in January 31, 2002 meeting and was formally approved by EPA and CDPHE (the LRA) in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA RE: Approval of NFA designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

PAC REFERENCE NUMBER: 000-504

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 000-4
Unit Name: New Process Waste Lines (NPWL)

This Final Update to the HRR for PAC 000-504 consolidates the information in the 1999 HRR Annual Update Report and subsequent updates with information gained through the disposition of this PAC, which was conducted in accordance with the RFCA accelerated action process. The disposition of PAC 000-504 is summarized in this update. The following HRR volumes contain PAC 000-504 information:

Update Report – 1999 (DOE 1999); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1984 to 2004

Historical Summary

The NPWL was a network of double-contained underground and aboveground pipelines and tanks used to transport liquid waste streams to Building 374, Waste Treatment Operations (DOE 1999). The location of PAC 000-504 is shown on Figure 14. Approximately 21,500 ft of NPWL and 20 valve vaults existed at the Site. For the most part, the NPWL system replaced the OPWL system (PAC 000-121), which was installed in 1952. Some of the OPWL was converted to NPWL. The NPWL transported a variety of waste streams and included the following (DOE 2005a):

- Laundry water;
- Nonradioactive and chemical laboratory waste;
- Uranium and beryllium waste;
- Americium and plutonium waste;
- PCBs;
- SEP water;
- Incidental water;
- High nitrate waste from Building 774; and
- Utilities waste.

PCOCs included radionuclides, metals, acids, bases, solvents, oils, PCBs, and photographic chemicals (2005a).

Releases from NPWL were documented at several PACs (DOE 1999) and are summarized below.

- Nitric acid, hydrofluoric acid, and hydrochloric acid from Building 123 scrubber (PAC 100-611). Spilled material was containerized and transferred into the Building 123 process waste system on November 7, 1989.
- Nitrate, radionuclides and acids from Valve Vaults 11, 12 and 13 (PAC 300-186). Valve vaults and piping were repaired, and contaminated soil was removed.
- Nitrate and radionuclides from process waste line leaks (PAC 700-147.1). Contaminated soil was removed.

Specific portions of the NPWL system are described in the Closeout Report for IHSS Group 000-4 (NPWL) (DOE 2005a) and other PAC writeups, including 000-101, 100-148, 100-602, 100-611, 300-186 and 800-1200.

The NPWL system was a RCRA-permitted unit, and portions were cleaned and closed in accordance with approved RCRA closure description documents (DOE 2002 and 2003a) and the RFETS RCRA Part B Permit (CO-097-05-03-01), Part X, Closure (CDPHE 1997). Closure of the unit is described in the Closure Summary Report for the 700/800 Process Waste Transfer System, RCRA Unit 374.3 (DOE 2005b) and the Closure Summary Report for Partial Closure of RCRA Unit 374.3 – 400 Area Process Waste Transfer System (DOE 2003b).

PAC Investigations

Surface soil samples under aboveground NPWL sections were sampled as part of OU 13 RFI/RI. Results indicated americium-241 and plutonium-239/240 were above background (DOE 1995).

Accelerated action characterization and removal activities within PAC 000-504 were planned and executed in accordance with the IASAP (DOE 2001), the ER RSOP (DOE 2003c), ER RSOP Notification #05-01 (DOE 2004b), and the IABZSAP (DOE 2004c). Soil sampling targeting NPWL and locations near NPWL was conducted from January 2002 to July 2005. A total of 151 locations were sampled to target valve vaults during removal, breaks in the pipeline containment, stained soil, pipe joints, and sections of NPWL that could not be clean-closed under the RFETS RCRA Part B Permit (CDPHE 1997). NPWL that were clean-closed under the Part B Permit did not require soil sampling. Samples were analyzed for radionuclides, metals, VOCs, SVOCs, nitrate and/or total recoverable petroleum hydrocarbons (TRPH) depending on specific targets and related historical and process knowledge. Only two soil sampling locations contained contaminants at activities or concentrations greater than RFCA WRW soil ALs (DOE 2005a; DOE et al. 2003).

In the 500 Area, at sampling location BX44-001 between Valve Vaults 12 and 13, americium-241 was detected at 566.5 pCi/g (the soil AL is 76 pCi/g), plutonium-239/240 at detected at 3,290.1 pCi/g (the soil AL is 50 pCi/g), uranium-234 was detected at 2,056 pCi/g (the soil AL is 300 pCi/g), uranium-235 was detected at 27.41 pCi/g (the soil AL is 8 pCi/g), and uranium-238 at detected at 2,056 pCi/g (the soil AL is 351 pCi/g). An area approximately 5 ft by 7 ft and 8 ft deep was excavated to remove contaminated soil. Following the removal of contaminated soil, confirmation sampling indicated radionuclide activities in the remaining soil were below RFCA WRW soil ALs (DOE 2005a).

In the 800 Area, at sampling location CF33-010 south of former Building 881, arsenic was detected at a concentration of 25.5 mg/kg (the soil AL is 22.2 mg/kg). Soil remediation was not required at this location based on RFCA because arsenic was detected in subsurface soil at a depth greater than 6 inches below the ground surface, and this concentration is in the range of background values at the Site (DOE 2005a).

Characterization results and accelerated actions for specific portions of the NPWL system are presented the Closeout Report for IHSS Group 000-4 as well as in individual closeout and data summary reports for the following IHSS Groups:

- IHSS Group 000-1 (DOE 2003d) approved by CDPHE (CDPHE 2003a);
- IHSS Group 000-2 (DOE 2005c) approved by CDPHE (CDPHE 2005a);
- IHSS Group 100-4 (DOE 2003e) approved by CDPHE (CDPHE 2003b);
- IHSS Group 300-4 (DOE 2003f) approved by CDPHE (CDPHE 2003c);
- IHSS Group 400-7 (DOE 2005d) approved by CDPHE (CDPHE 2005b);
- IHSS Group 500-1 (DOE 2004d) approved by CDPHE (CDPHE 2004a);
- IHSS Group 500-3 (DOE 2005e) approved by CDPHE (CDPHE 2005c);
- IHSS Group 700-2 (DOE 2005f) approved by CDPHE (CDPHE 2005d);
- IHSS Group 700-3 (DOE 2005g, 2005h) approved by CDPHE (CDPHE 2005e, 2005f);
- IHSS Group 700-7 (DOE 2004e) approved by CDPHE (CDPHE 2004b);
- IHSS Group 700-10 (DOE 2004f) approved by CDPHE (CDPHE 2004c);
- IHSS Group 800-1 (DOE 2004g) approved by CDPHE (CDPHE 2004d);
- IHSS Group 800-3 (DOE 2005i) approved by CDPHE (CDPHE 2005g);
- IHSS Group 800-5 (DOE 2004h) approved by CDPHE (CDPHE 2004e); and
- IHSS Group 800-6 (DOE 2003g) approved by CDPHE (CDPHE 2003d).

Approximately 15,300 ft of NPWL were removed, and 6,200 ft of NPWL were clean closed and left in place. Twenty valve vaults were part of the NPWL network. Six valve vaults were completely removed, three valve vaults were partially excavated and flow filled, and eleven valve vaults were partially excavated and backfilled with soil (DOE 2005a). The three valve vaults that were flow-filled contained residual low-level radioactive contamination. Valve Vault 2 contained 0.386 grams of total uranium and 0.00000069 grams of total plutonium and americium. Valve Vault 8 contained 0.0148 grams of total uranium and 0.000124 grams of total plutonium and americium. Valve Vault 9 contained 0.0151 grams of total uranium and 0.0000151grams of total plutonium and americium.

The 11 valve vaults that were backfilled with soil met the unrestricted release criteria.

Portions of the NPWL were removed as part of accelerated actions under other IHSS Groups, as listed below.

- The aboveground NPWL that were present south of the SEP (IHSS Group 000-1) and transferred waste from Building 910 to Building 774 were removed in 2003 (DOE 2003d).

- Two NPWL sections located west of Building 865 (IHSS Group 800-1) were tapped and drained, filled with epoxy, and removed (DOE 2004g). These sections were packaged and sent off site for disposal as low-level mixed waste. The northernmost line was removed up to Valve Vault 6, and all of the line to the Building 889 area was removed (there was no remaining end to grout).
- NPWL from Valve Vault 2 to Building 883 and from Valve Vault 2 to Valve Vault 1 (IHSS Group 800-3) were removed (DOE 2005i). NPWL from Valve Vault 2 to Valve Vault 3 were not removed, but were clean-closed in accordance with the RCRA Part B permit. Valve Vault 2 was removed to greater than 4 ft bgs and grouted.
- An 8-ft section of metal housing around the NPWL adjacent to Building 889 (IHSS Group 800-6) was removed (DOE 2003g). The remaining line consists of a high-density polyethylene (HDPE) line in which the actual waste line resides. The waste line is PVC pipe. The waste line was capped, and the space between the waste line and the HDPE line was filled with grout.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for PAC 000-504 based on the following:

- Analytical results were less than RFCA WRW soil ALs, with the exceptions noted above.
- Most of the potential sources of contamination existing in soil at activities greater than RFCA WRW soil ALs were removed.
- All valve vaults associated with NPWL were either partially excavated and backfilled or flow filled, or were completely removed, thereby eliminating these areas as potential sources of future contaminant releases.
- Approximately 15,300 ft of NPWL were excavated and disposed off site, including line segments that could not be cleaned closed in accordance with RCRA.
- Approximately 6,200 ft of NPWL were cleaned closed and left in place. All remaining NPWL were rinsed, sampled for RCRA constituents, and shown to be RCRA-clean.
- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion, and therefore, the subsurface soil with the arsenic concentration exceeding the WRW soil AL did not require remediation.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for NPWL (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 000-504 on October 6, 2005 (CDPHE 2005h). Also, after review of closeout and data summary for other IHSS Groups by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for portions of PAC 000-504 (refer to above listing).

Comments

PAC 000-504 includes PIC 50.

References

CDPHE, 1997, RCRA Part B Permit CO-097-05-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado.

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CDPHE, 2004d, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-1 (B865) – Approval, March 19.

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CDPHE, 2005g, Correspondence to J. Rampe, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-3 (B883) – Approval, June 7.

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DOE, 2003g, Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

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DOE, 2004c, Industrial Area and Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004d, Data Summary Report for IHSS 500-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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DOE, 2004f, Data Summary Report for IHSS 700-10, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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DOE, 2005g, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

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DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 000-505

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 000-3
Unit Name: Storm Drains

This Final Update to the HRR for PAC 000-505 consolidates the information in the 1999 HRR Annual Update Report with information gained through the disposition of this PAC, which was conducted in accordance with the RFCA accelerated action process. The disposition of PAC 000-505 is summarized in this update. The following HRR volume contains PAC 000-505 information:

Update Report – 1999 (DOE 1999).

Date(s) of Operation or Occurrence

1952 to 2004

Historical Summary

Storm drains were identified as a PAC in the 1999 Annual Update to the HRR (DOE 1999). At that time, 239 storm drains were thought to be present at RFETS. This estimate originally included the ITS which is not part of the storm drain system and was inadvertently included in the original figure. The total linear feet of storm drains in PAC 000-505 measures 50,975 ft. The location of PAC 000-505 is shown on Figure 13.

The storm drains provided site drainage from roads, parking lots, and other areas. The drains discharged into the creeks and drainages north and south of the Site. Some footing drains from site buildings also discharged to storm drains. The storm drains were designed to convey surface water away from the Site, but unplanned accidental discharges to the system have occurred.

There are eight specific contaminant release areas associated with PAC 000-505, many of which are separate IHSSs or PACs within other IHSS Groups. These contaminant release areas were dispositioned in accordance with RFCA (DOE et al. 2003). The disposition of these sites is summarized in the following:

- IHSS 143 – Old Outfall – No Further Accelerated Action Justification for 771 Outfall PAC Reference Number 700-143 (DOE 2004a) approved by CDPHE (CDPHE 2004a);
- IHSS 173 – Wash Water From The Degreasing Of Depleted Uranium Parts Near Building 991 – Closeout Report for IHSS Group 900-1 (DOE 2004b) approved by CDPHE (CDPHE 2004b);
- IHSS 400-205 – Release Of Nitric Acid/Nitrad Waste Solution From Building 460 – Data Summary Report for IHSS Group 400-5 (DOE 2004c) approved by CDPHE (CDPHE 2004c);

- PAC 400-803 – Release Of Miscellaneous Materials Into The Storm Drain West Of Building 446 – Data Summary Report for IHSS Group 400-4 (DOE 2004d) approved by CDPHE (CDPHE 2004d);
- PAC 400-801 – PCB Runoff From Building 444 Courtyard – Data Summary Report for IHSS Group 400-3 (DOE 2003) approved by CDPHE (CDPHE 2003) and Data Summary Report for IHSS Group 000-3, PAC 000-505 (DOE 2005a) approved by CDPHE (CDPHE 2005a);
- PAC 700-1103 – PCB Runoff From Building 707 – Closeout Report for IHSS Group 700-2 (DOE 2005b) approved by CDPHE (CDPHE 2005b);
- Building 776 Storm Drain (IHSS 700-150.2[S]) – Closeout Report for IHSS Group 700-3 Volume I (DOE 2005c) approved by CDPHE (CDPHE 2005c) and Data Summary Report for IHSS Group 000-3, PAC 000-505 (DOE 2005a) approved by CDPHE (CDPHE 2005a);
- Building 371 Ditch And Storm Drain Runoff – Data Summary Report for IHSS Group 000-3, PAC 000-505 (DOE 2005a) approved by CDPHE (CDPHE 2005a)

Storm drains were disrupted, removed or retained for use after site closure (DOE 2005a). For the most part, storm drains were removed unless they were very deep or removal presented slope stability problems. Storm drains ranged from 1.5 to 45 ft below the surface. Approximately 45,475 ft of storm drains were removed and approximately 5,500 ft of the storm drains remain in place to convey flows to North Walnut Creek via Functional Channel 3. Storm drains left in place were flow filled or grouted except for storm drain associated with Functional Channel 2 (C-126). Approximately 210 ft of this storm drain remains.

All manholes and catch basins within 3 ft of the surface were removed (DOE 2005a and 2005d). Manholes at a depth of 3 ft below the surface were flow filled. Grates and associated rings were removed to a depth of 3 ft below the surface and the remaining structure was flow filled.

PAC Investigations

Building 371 Ditch and Storm Drain Runoff

Although there were no reported specific contaminant release events to a Building 371 storm drain or ditch, these drains and ditches were sampled in 1987. It is not known if samples were collected during a storm event or from standing water (DOE 1999). Results showed that the gross alpha and beta concentrations in the storm drains and ditches were of the same order of magnitude as the surface water standards, and nitrate was well below the surface water standard (DOE 2005a).

More recent surface water data from a performance monitoring location (SW018), established in October 2003 in the unnamed drainage just east of Building 371/374, indicated americium-241, plutonium-239/240 and total uranium activities at SW018 were well below their surface water standards of 0.15 pCi/L, 0.15 pCi/L, and 10 pCi/L, respectively (DOE 2005a).

Ponds A-3 and A-4

As a result of the routine predischage sampling for Pond A-4, conducted on November 3, 2004, elevated americium-241 activities were noted in Pond A-4. These elevated activities were detected in samples collected by both DOE and CDPHE. These activities exceeded the RFCA surface water ALs for americium-241 and, as a result, the pond water was not discharged.

In early December 2004, DOE collected a number of surface water samples in the North Walnut Creek Drainage to investigate the source of elevated americium-241 noted in Ponds A-3 and A-4. The sampling was concentrated in the area where Buildings 771/774 formerly stood. One sample, collected from a pool of water in OPWL (OPWL) Manway 3, northwest of Building 771, contained elevated americium-241 activities without significant plutonium-239/240 activity, which is the same americium-241/plutonium-239/240 signature observed in Ponds A-3 and A-4. This manway received outfall from former Building 771 and consisted of a series of sanitary sewer lines, footing drains, and so forth that dumped into storm drain Grate 771-4 at Sixth Street.

Based on this sampling result, actions to stop any additional water from this source from entering North Walnut Creek were taken. The manway, which had been covered with soil as a result of site grading activities at former Building 771, was excavated and flows from the incoming pipes were intercepted, analyzed, and treated as needed. All pipes to and from the manway were removed, as well as the manway itself. The storm drain from Building 771 was grouted.

Subsequently, the water in Pond A-4 was treated using a co-precipitation and filtration process and met stream standards for discharge.

No Further Action Recommendation

PAC 000-505 is proposed for NFAA because of the following:

- Storm drains and culverts were removed or disrupted except for a few drains in the IA that will continue to function as originally intended.
- The specific potential release areas were dispositioned.
- The SSRS does not indicate that subsurface soil removal is necessary.
- Results of the stewardship evaluation indicated that additional action was not necessary.

After review of the Data Summary for IHSS Group 000-3 PAC 000-505, Storm Drains (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 505 on October 6, 2005 (CDPHE 2005a). Additionally, after review of other documentation by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for storm drains within specific IHSS Groups as referenced above.

Comments

None

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CDPHE, 2005b, Correspondence to J. Legare, DOE RFPO, from S. Gunderson, CDPHE, RE: Approval, Draft Closeout Report, IHSS Group 700-2 (UBC 707 – Plutonium Fabrication and Assembly, and UBC 731 - Building 707 Process Waste), February 2005, March 15.

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DOE, 2005a, Data Summary for IHSS Group 000-3 PAC 000-505, Storm Drains, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, Closeout Report for IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, March.









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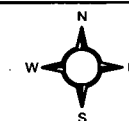
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Figure 15
HRR 100 Area
IHSSs and PACs

KEY

-  Stream
-  Dirt road
-  PAC
-  IHSS
-  HRR area
-  Lake
-  Asphalt
-  Building



200 0 200 Feet

Scale = 1: 3600

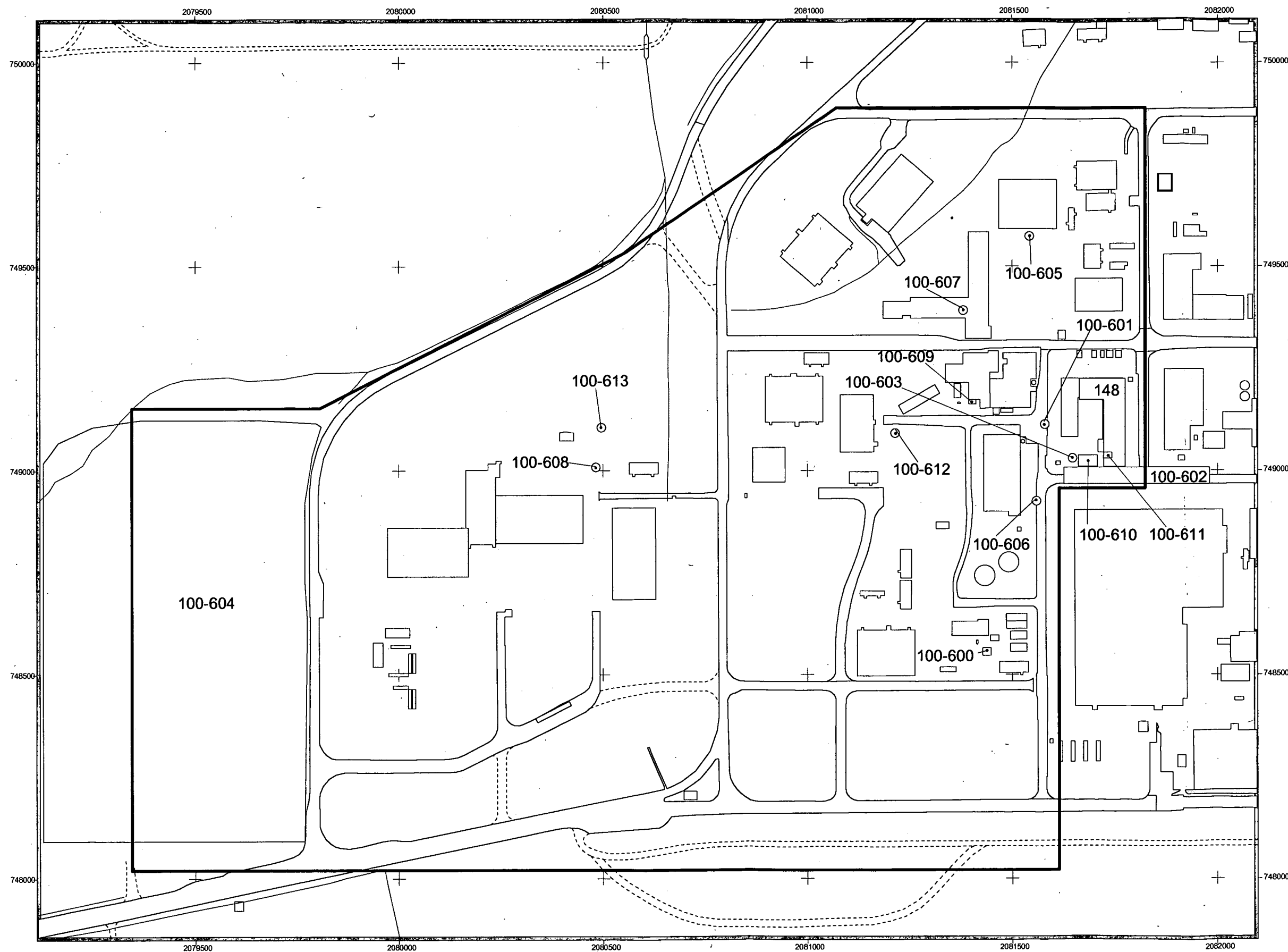
State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.28.05



File: W:\Projects\FY2005\HRR Update\Figures\
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PAC REFERENCE NUMBER: 100-148

IHSS Number: 148
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 100-4
Unit Name: Waste Leaks (IAG Name: Waste Spills)

This Final Update to the HRR for PAC 100-148 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 148 is summarized in this update. The following HRR volumes contain IHSS 148 information:

Original Report – 1992 (DOE 1992);
Update Report – 1998 Annual (DOE 1998a);
Update Report – 2002 Annual (DOE 2002a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1953 to approximately 1975.

Historical Summary

PAC 100-148 encompasses the eastern wing of Building 123. The location of IHSS 148 is shown on Figure 15. Building 123, the Health Physics Laboratory, generated low-level radioactive waste, as well as chemical wastes. Process wastes reportedly leaked from the Original Process Waste Lines (OPWL) (PAC 000-121), including nitrate-bearing wastes that may have contained radionuclides. Unconfirmed reports of contaminant spills were also indicated in interviews with building employees. In the late 1960s or early 1970s, a cesium-contaminated liquid was reportedly spilled on the concrete floor in Room 109. The floor was immediately sealed to immobilize the contamination. Room 109 also contained source storage pits. Undocumented thorium research was performed in Room 105. Scoping surveys conducted in May through July 1997 revealed elevated levels of radioactivity in both Rooms 105 and 109. In-situ gamma spectroscopic measurements performed in August 1997 indicated the presence of cesium-137 and thallium-232 in Rooms 109 and 105, respectively (DOE 1998b). In 1998 Building 123 was decontaminated and removed down to the building slab (DOE 1998c).

Persons interviewed for the CEARP Phase I document indicated several small spills of nitrate-bearing wastes occurred around the outside of Building 123. These wastes may have contained radionuclides. Additionally, interviewees indicated there were potential releases of nitrate-bearing wastes from the OPWL buried beneath Building 123. This pipeline was in use from the start of operations in Building 123 until the OPWL were replaced by the New Process Waste Lines (NPWL). The abandonment of the OPWL beneath Building 123 occurred no later than February 1975 when engineering drawings documented the abandonment of the OPWL system. The abandoned OPWL were typically left in-place.

Building 123 was serviced by a 4-inch-diameter process waste line buried beneath the north and east wings of the building. The main process waste line drained from west to east in the north wing, and from north to south in the east wing. The pipe was sloped at 1 percent. A number of connections were made to the main pipe, some of which consisted of headers servicing a number of process waste drains in the building. The pipe was constructed of iron. The OPWL piping from Building 123 led to an underground tank system south of Building 441 that collected wastes generated by both Buildings 123 and 441. From this tank system, the process waste materials were pumped out for treatment in the process waste system.

The OPWL drain was not double-contained, and varied in depth from approximately 0.5 to 3 ft beneath the bottom of the concrete floor of Building 123. The line came out from beneath the southern end of the east wing of the building, with an invert elevation of approximately 6,032.5 ft. Interviewees have stated that this line, being constructed of a type of iron, probably leaked considerable amounts of waste without personnel being aware of the leak. The types of waste consisted of laboratory wastes from analysis of urine, fecal, and other bioassay samples. Nitrates and low levels of radionuclides were associated with the wastes carried in the OPWL. The NPWL that replaced the OPWL consisted of either double-contained or overhead lines (DOE 2000a).

IHSS Investigations

As described in IASAP Addendum #IA-02-01 (DOE 2001a), PCOCs at IHSS 148 were determined based on data collected during the characterization of UBC 123, as summarized in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b), and data collected during previous studies (DOE 2000b, 2001c.). These pre-accelerated action data, which were greater than background plus two standard deviations or method detection limits (MDLs), along with RFCA Tier I and Tier II soil ALs (DOE et al. 1996), are referenced in the Closeout Report for IHSS Groups 100-4 and 100-5 (DOE 2003b). PCOCs at IHSS 148 include radionuclides, metals, and VOCs. Because a sufficient number of samples were collected during previous studies to characterize IHSS 148, additional characterization was not required. Results from previous sampling and analysis of surface and subsurface soil at UBC 123 and IHSS 148 indicated that:

- Lead was detected in subsurface soil above the Tier I soil AL at one location.
- Radionuclides and metals were detected in subsurface soil at concentrations greater than background plus two standard deviations at UBC 123 and IHSS 148.
- An arsenic concentration exceeding the Tier II soil AL but less than background was detected at one location in surface soil.
- A beryllium concentration exceeding the Tier II soil AL was detected at one location in surface soil.
- Methylene chloride was detected in subsurface soil at levels slightly above the RFCA Tier II soil AL.

A RFCA (DOE et al. 1996) accelerated action was implemented in 2002 in accordance with ER RSOP Notification #02-01 (DOE 2002b) that included removal of the Building 123 slab, footers, source pits, manholes, sumps, process waste lines (OPWL and NPWL), and contaminated soil, as well as site reclamation (DOE 2002b). Sumps and process waste lines within IHSS 148 were

excavated and packaged for disposal. Confirmation sampling results from the soil beneath the sumps and process waste lines indicated all contaminant concentrations were less than RFCA Tier II soil ALs. Activities were conducted between January 29 and April 18, 2002. Details are provided in the Closeout Report (DOE 2003b).

Remaining conditions at IHSS 148 include the following:

- Residual radionuclide activities in subsurface soil are less than RFCA Tier II soil ALs (DOE et al. 1996) and the subsequently modified soil ALs, based on the WRW ALs (DOE et al. 2003) and only slightly greater than background plus two standard deviations.
- Residual lead concentrations in subsurface soil ranged from 1.13 to 12.2 mg/kg and are less than the Tier II and WRW soil ALs.
- Residual SVOC concentrations are less than Tier II and WRW soil ALs and include naphthalene (10µg/kg), fluoranthene (410- 810 mg/kg) and pyrene (429 – 740 µg/kg).
- Radionuclide activities in surface soil are less than Tier II and WRW soil ALs and only slightly greater than background plus two standard deviations (DOE 2003b). Americium-241 was detected at activities ranging from 0.05 to 0.13 pCi/g; plutonium-239/240 was detected at activities ranging from 0.06 to 0.13 pCi/g; uranium-235 activities ranged from 0.13 to 0.30 pCi/g, and uranium-238 activities ranged from 1.66 to 5.06 pCi/g.
- A beryllium concentration in surface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the area of concern, was detected at only one location, and was 0.16 milligram per kilogram (mg/kg) greater than the RFCA Tier II soil AL but less than the WRW AL.
- Methylene chloride concentrations in subsurface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the area of concern, were greater than the RFCA Tier II soil AL at six locations and range from 12 to 29 µg/kg. Methylene chloride was found in laboratory blanks associated with the data set.

The RFCA accelerated action initiated by ER RSOP Notification #02-01 (DOE 2002b) also resulted in the complete removal of NPWL Valve Vault 18 and the line segment that connected it to Building, 123. The rinsate from Valve Vault 18 had a gross alpha/gross beta activity of 7.08 pCi/L (DOE 2005).

All excavated areas were backfilled and revegetated after confirmation sampling results were received and discussed with regulatory agencies through the consultative process.

No Further Action Recommendation

Based upon characterization sample results collected in accordance with IASAP Addendum #IA-02-01 (DOE 2001a), no potential contaminant or residual contaminant source could be identified. Therefore, in accordance with RFCA (DOE et al. 1996), IHSS 148 was proposed for NFAA.

DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS Group 100-4 on April 18, 2003 (CDPHE 2003).

Comments

None

References

- CDPHE, 2003, Correspondence to R. DiSalvo, DOE, RFFO, from S. Gunderson, CDPHE, RE: Final Closeout Report for IHSS Groups 100-4 and 100-5, April 18.
- DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.
- DOE, 1998a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 1998b, Proposed Action Memorandum for the Decommissioning of Building 123, Rocky Flats Environmental Technology Site, Golden, Colorado, March.
- DOE, 1998c, Final Close-Out Report, Building 123 Decommissioning Project, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2000a, Final Sampling and Analysis Plan for the Characterization of Under Building Contamination for UBC 123 and Building 886 Implementing Horizontal Directional Drilling and Environmental Measurement While Drilling, Rocky Flats Environmental Technology Site, Golden, Colorado, May.
- DOE, 2000b, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2001a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.
- DOE, 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2001c, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.
- DOE, 2002a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.
- DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2003b, Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, Colorado, March.
- DOE, 2005, Closeout Report for IHSS Group 000-4, New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.
- DOE, CDPHE, and EPA, 1996 Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.
- DOE, CDPHE, and EPA, 2003, RFCA Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 100-600

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Mercury Spill – Valve Vault 124-B, Building 124

This Final Update to the HRR for PAC 100-600 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-600 is summarized in this update. The following HRR volumes contain PAC 100-600 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

July 25, 1990

Historical Summary

The location of PAC 100-600 is shown on Figure 15. On July 25, 1990, while removing two water flow transmitters from Valve Vault 124-B, located approximately 50 ft south of Building 124, mercury leaked out of one transmitter that was inverted for removal. Approximately 15 minutes after the transmitters were removed, mercury was found on the valve vault floor and on the ground. Although the majority of the spilled mercury was confined to a 6-ft-square area on the concrete floor of the valve vault, some mercury was spilled on the ground and concrete outside the valve vault. The mercury spill outside of the valve vault occurred while one of the transmitters was carried approximately 6 ft to the corner of the valve vault surface cement apron.

The spill consisted of approximately 2.75 lbs of mercury.

Upon notification, the HAZMAT Team responded immediately. The immediate response activities included the following:

- Flow transmitters were secured and bagged to prevent further releases of mercury.
- The area of contamination was secured and cordoned off.
- The sump pump was turned off and lockout/tagout was performed.
- The HAZMAT Team attempted to remove the mercury from the valve vault floor using a vacuum system (proved ineffective).
- The HAZMAT Team covered the mercury with sulfur and swept it off the ground.
- The HAZMAT Team removed contaminated soil outside the valve vault.
- Industrial Hygiene personnel monitored the activities with a Jerome Model #411 Gold Film mercury analyzer.

- A plastic cover was constructed over the area to prevent rainwater from spreading the mercury.

Additional follow up response activities were conducted. The incident was reported to CDH, EPA's National Response Center, DOE Headquarters, and the local EPA. Also, RCRA CIPR No. 90-007 was prepared.

PAC Investigations

On July 27, 1990, an outside contractor conducted an emergency cleanup of the valve vault and the surrounding ground and concrete. The contractor vacuumed the mercury from the valve vault and excavated mercury-contaminated soil on July 27. Following the cleanup, soil samples were collected and analyzed. Analyses indicated mercury concentrations above desired cleanup levels. Excavation and sampling efforts were repeated three more times until the desired cleanup levels were achieved. In addition to excavation activities, cleanup operations included the application of sodium thiosulfate, a mercury absorbent, to the valve vault floor, the cement floor within Building 222 (Building 222 houses Valve Vault 124-B), and south of the building. Following this activity, vacuuming was conducted.

Following excavation, soil samples were analyzed using both the TCLP and an inorganic analysis for total metals in order to verify that the cleanup was complete. Following the last phase of excavation, the results of these analyses were:

- TCLP analysis in mg/L: 0.001, 0.030, and 0.040; and
- Inorganic analysis for total metals in mg/kg or ppm: 3.0, 5.3, and 6.9.

No Further Action Recommendation

PAC 100-600 was addressed through the consultative process in an NFA Working Group meeting on December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 100-600 because the spill was cleaned up and sampling results demonstrated that the cleanup had effectively removed the spilled mercury. An NFA was verbally agreed to in the December 19, 2001 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Approval Letter for NFA Designation for IHSSs and PACs, Rocky Flats Environmental Technology Site, Golden, Colorado, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-601

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 123 Phosphoric Acid Spill

This Final Update to the HRR for PAC 100-601 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-601 is summarized in this update. The following HRR volumes contain PAC 100-601 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

April 13, 1989

Historical Summary

The location of PAC 100-601 is shown on Figure 15. Two 5-gallon plastic containers of phosphoric acid, which were among old chemicals awaiting disposal in a storage cabinet outside of Building 123, deteriorated and leaked part of their contents onto the ground. Approximately 1 gallon of 1,2-ethylhexyl phosphoric acid leaked from the two containers. At the time the release was detected (April 13, 1989), approximately 1 cup (8 ounces) of the acid was on the ground around the cabinet. The quantity of phosphoric acid released to the environment was minimal and is expected to have been rapidly neutralized through interaction with soil in the immediate vicinity of the spill. The Rocky Flats RCRA Compliance Coordinator was notified.

PAC Investigations

No further investigation was required because the spill was small and the phosphoric acid was rapidly neutralized.

No Further Action Recommendation

PAC 100-601 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the November 14, 2001, meeting and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-602

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 000-2
Unit Name: Building 123 Process Waste Line Break

This Final Update to the HRR for PAC 100-602 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-602 is summarized in this update. The following HRR volumes contain PAC 100-602 information:

Original Report – 1992 (DOE 1992).

Dates(s) of Operation or Occurrence

April 13, 1989

Historical Summary

The location of PAC 100-602 is shown on Figure 15. Valve Vault 17, located on Cottonwood Avenue between Buildings 443 and 444, was flooded with approximately 1,200 gallons of aqueous waste on April 13, 1989. Subsequent investigation showed the source of the waste was a break in the process waste line in Manhole 1, south of Building 123. Leaks from the break had migrated into bedding material surrounding the pipe and ultimately reached Valve Vault 17 through either pipe bedding materials (soil) or a polyvinyl chloride (PVC) electrical conduit. The release also migrated into a section of the abandoned OPWL network (PAC 000-121). Discharge of Building 123 process waste into the broken line was discontinued on April 18, 1989, 5 days after the release to Valve Vault 17 was first detected. The potentially affected area included the process waste line between Manhole 2 and Valve Vault 18 (immediately south of Building 123), the process waste line between Valve Vault 18 and Valve Vault 17, soil around Valve Vault 18 and Valve Vault 17, and the OPWL pipeline between Manhole 2 and Manhole 3. In July 1989, groundwater containing blue dye used several months earlier to trace the release, was observed seeping into excavations around Valve Vault 18. According to one report, the release may also have reached the storm sewer system.

The release consisted of Building 123 process waste. During the 5-day period between detection of the release and diversion of Building 123 wastes from the broken line, the following materials were likely released to the environment (based on typical daily quantities of wastes discharged from Building 123):

- 25 gallons urine;
- 12.5 gallons nitric acid (unknown concentration);
- 20 gallons hydrochloric acid (unknown concentration);
- 1.5 pounds ammonium thiocyanate;

- 1.0 pound ammonium iodide; and
- 2.5 gallons ammonium hydroxide (unknown concentration).

The above constituents would have been diluted in approximately 2,000 gallons of tap water.

Process waste discharge to the broken line was discontinued. Soil sampling was conducted to determine the source and extent of the release. A temporary aboveground line was installed, and a replacement underground line was planned for completion by June 1, 1989. Because the affected areas were near existing IHSSs scheduled for investigation and remediation activities (see PACs 400-122 and 100-148), no cleanup was initiated.

Minor amounts of naturally occurring uranium were detected in soil and water samples collected after the release. Alpha activity up to 140 pCi/L was recorded in samples of the waste from Valve Vault 17. One water sample from a manhole south of Building 123 also contained 8 percent ethylene glycol.

Water and soil samples collected for several weeks after the release indicated contamination levels (nitrate, chloride, and pH) decreased steadily after the broken line was bypassed.

PAC Investigations

A RFCA (DOE et al. 1996) accelerated action was conducted at this PAC in accordance with ER RSOP Notification #03-14 (DOE 2003). (Note that Notification #03-14 addresses potential OPWL actions, but that the features discussed under PAC 100-602 are part of the NPWL system. In accordance with Notification #03-14 the top 4 ft of Valve Vault 18 was removed and the remainder of the vault was filled with dirt. The line from Valve Vault 18 to Valve Vault 17 was RCRA clean closed and left in place. The line from Valve Vault 18 to Building 123 was removed as well as the lines to Buildings 122 and 460 (DOE 2005a). Analytical results indicated aluminum was the only analyte detected above background at a concentration of 40,000 mg/kg (DOE 2005b). This value is less than the WRW soil AL (DOE et al 2003).

No Further Action Recommendation

Based on the removal of the valve vault and the lines, PAC 100-602 was proposed for NFAA in the Closeout Report for IHSS Group 000-2 (DOE 2005b). DOE received approval of NFAA status for PAC 100-602 from CDPHE (the LRA) on October 6, 2005.

Comments

None

References

CDPHE, 2005 approval Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), October 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2003, FY03 Environmental Restoration RFCA Standard Operating Protocol Notification #03-14 for IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005a, Closeout Report for IHSS Group 000-4 New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October

DOE, 2005b, Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, RFCA Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 100-603

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 123 Bioassay Waste Spill

This Final Update to the HRR for PAC 100-603 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-603 is summarized in this update. The following HRR volumes contain PAC 100-603 information:

Original Report – 1992 (DOE 1992);
Update Report – 2001 Annual (DOE 2001a); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

June 9, 1989

Historical Summary

The location of PAC 100-603 is shown on Figure 15. An underground process waste line from Building 123 was being excavated and replaced because of a break in the line (PAC 100-602). The excavated end of the broken line was temporarily capped with a plastic bag, and process waste from Building 123 was rerouted to bypass the broken line. The pump used to reroute the waste failed and allowed some of the waste to overflow into the broken line. Part of this waste leaked around the plastic bag and into the excavation where the broken line was capped. The release occurred within the excavation. Rainwater that was being pumped out of the trench at the time of the spill was not contaminated, as confirmed by sampling (DOE 1992).

The release consisted of bioassay waste containing hydrochloric acid and nitric acid with a pH of approximately 1. The waste also may have contained urine, and up to a combined total of 1.5 gallons of ammonium thiocyanate, ammonium iodide, and ammonium hydroxide. The calculated maximum volume of the release was 30 gallons. Due to inclement weather, the released material mixed with rainwater in the excavation.

The release was contained within the trench and within 8 ft of the building with berms. Results from 11 samples collected shortly after the incident to evaluate the spread of contamination indicated contamination was restricted to the excavation within 8 ft of Building 123.

Approximately 100 gallons of rainwater potentially contaminated by the spill was neutralized, pumped from the excavation, and transferred to the process waste system for treatment in Building 374.

PAC Investigations

Samples were collected to evaluate the spread of contamination. The release was documented in RCRA CPIR No. 89-006 (DOE 1989).

In late 2000, four subsurface soil samples were collected in and around PAC 100-603 as part of the UBC 123 characterization project. Each sample was analyzed for VOCs, SVOCs, total metals, and isotopic radionuclides. Data analysis is presented in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b).

Samples from locations HDD-3-Trench-A and HDD-3-Trench-B (Figure 2.7, DOE 2002) were collected within the PAC boundaries at approximately 20 inches below the top of existing asphalt. VOC and SVOC concentrations were reported below MDLs or well below RFCA Tier II soil ALs (DOE et al. 1996). Most radionuclide and metal results were reported to be nondetects or at levels less than Site background means plus two standard deviations (DOE 2001b). All of the reported concentrations were significantly below the RFCA Tier II soil ALs. Analytical results for HDD-3-01 and HDD-3-02 are included in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b). During UBC 123 remediation, sampling location HDD-3-02 was removed. Residual contamination at sampling location HDD-3-01 indicated acetone was present at 30 µg/kg and naphthalene was present at 13 µg/kg.

No Further Action Recommendation

The results from samples collected shortly after the spill and subsequently, during the UBC 123 characterization project, identified no current or potential contaminant source for PAC 100-603. Based upon this finding, PAC 100-603 was proposed in the 2001 Annual HRR Update (DOE 2001a) for NFA consistent with criteria set forth in RFCA (DOE et al. 1996). DOE received NFA approval from CDPHE (the LRA) and EPA on February 14, 2002 (CDPHE and EPA 2002) with the caveat that further clarification would be provided. Clarification was provided in a Working Group Quarterly Letter (#32 of AR1) and in the 2002 HRR Annual Update (DOE 2002).

Comments

The original HRR (DOE 1992) mentions that the waste stream for Building 123, a bioassay laboratory, may have had small concentrations of ammonium thiocyanate, ammonium iodide, and ammonium hydroxide. While these compounds were not specifically sampled in 2000, it is very unlikely that RFCA Tier II ALs could have been exceeded. The RFCA Tier II soil ALs for ammonium and cyanide are greater than both 1 million and 40,900 ppm, respectively.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1989, RCRA CIPR No. 89-006, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2001a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 100-604

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: T130 Complex Sewer Line Leaks

This Final Update to the HRR for PAC 100-604 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-604 is summarized in this update. The following HRR volumes contain PAC 100-604 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

Late September to early October 1990

Historical Summary

The location of PAC 100-604 is shown on Figure 15 (entire T130 trailer complex). Sanitary sewer pipes serving Trailer T130A, Trailer T130B, Trailer T130C, and Trailer T130D in the T130 trailer complex were discovered to be leaking on numerous locations. The leaks were blamed on poor construction coupled with inadequate inspection during initial installation. Poor cold weather precautions were also identified as a likely cause, suggesting that the pipes froze and cracked. The T130 complex was installed in 1989 and 1990 and was used solely for offices. The material released from the sewage lines was not described in detail. No estimate is available of the amount of material released.

Domestic water to the trailers was turned off and repairs were completed within 1 day. The Site Clean Water Group determined that the release did not require a report to the State of Colorado provided water systems were not reactivated until repairs were complete.

PAC Investigations

No further investigation was required because the release was not reportable.

No Further Action Recommendation

PAC 100-604 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2002. Based on these discussions, agreement was reached that a NFA was justified because the release was not reportable. A NFA was verbally agreed to in the November 14, 2002 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

The released material is believed to have been typical sanitary sewage. Although references indicate the leakage occurred in sewer lines serving Trailers T130A, T130B, T130C, and T130D, the precise locations of the leaks are not known.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-605

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 115 Hydraulic Oil Spill

This Final Update to the HRR for PAC 100-605 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-605 is summarized in this update. The following HRR volumes contain PAC 100-605 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

Week ending May 23, 1989

Historical Summary

The location of PAC 100-605 is shown on Figure 15. During the week ending May 23, 1989, hydraulic oil spilled near Building 115 when a forklift hydraulic line ruptured. Several nearby vehicles were sprayed with oil. It is not known whether the oil spilled onto soil or pavement. Approximately 2 gallons of hydraulic oil were released.

PAC Investigations

No further investigation was required because the spill was very small.

No Further Action Recommendation

PAC 100-605 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. An NFA was justified because the spill was probably not a reportable quantity. An NFA was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

The precise location of the hydraulic oil leak is not known. The location shown on Figure 15 is based on the roadway configuration around Building 115 and should be considered approximate.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-606

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 125 TCE Spill

This Final Update to the HRR for PAC 100-606 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-606 is summarized in this update. The following HRR volumes contain PAC 100-606 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

Week ending January 13, 1989

Historical Summary

During the week ending January 13, 1989, a small spill of trichloroethylene (TCE) occurred just south of the Building 125 south dock. The spill originated from a faulty valve on a supply drum. The material spilled onto asphalt. Approximately 1 cup (8 ounces) of TCE was released to the asphalt pavement at the location. The location of PAC 100-606 is shown on Figure 15. The TCE supply drum was immediately righted to prevent further leaks. It was determined that the release did not constitute a reportable quantity for EPA.

PAC Investigations

No further investigation was required because the spill was small and was to asphalt.

No Further Action Recommendation

PAC 100-606 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified because the release was not a reportable quantity. An NFA was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

An NFA was justified for PAC 100-606 because the spill was not a reportable quantity.

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-607

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 111 Transformer PCB Leak

This Final Update to the HRR for PAC 100-607 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-607 is summarized in this update. The following HRR volumes contain PAC 100-607 information:

Original Report – 1992 (DOE 1992);
Update Report – 2000 (DOE 2000a);
Update Report – 2001 Interim (DOE 2001a);
Update Report – 2001 Annual (DOE 2001b); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 1954 to mid-1986

Historical Summary

The location of PAC 100-607 is shown on Figure 15. A large electrical transformer was located inside the Building 111 basement (Figure 2.7, DOE 2001b). The transformer held approximately 500 gallons of dielectric cooling oil which, at one time, contained polychlorinated biphenyls (PCBs) (DOE 1992). In February 1984, the transformer (111-1) was first documented leaking into the gravel filled secondary containment, (DOE 1992). The secondary containment basin for Transformer 111-1 was designated PAC 100-607 in the HRR in June 1992.

On January 30, 1986, EPA conducted a survey of Rocky Flats to determine compliance with federal PCB regulations. The inspection identified a number of leaking transformers, including the Building 111 transformer (DOE 1992). Follow up inspection and repair by Plant personnel indicated leaks originated at the transformer's tap changer and oil sample valve.

An unknown amount of PCB-bearing dielectric oil leaked from the transformer between February 1984 (possibly earlier) and early to mid-1986. It is not known whether the leaks during this period were continuous or intermittent. Samples of the oil collected in early 1984 indicated 17 ppm Aroclor-1260. Service records indicated oil samples were collected on July 12, 1985 (251 ppm PCBs), and on January 7, 1987 (7.3 ppm PCBs). Engineering design drawings show that an isolated footing drain system was installed within the secondary containment structure and routed approximately 30 ft east of the building to a manhole sump. A waterproofing compound was used during installation of the manhole to prevent seepage into and out of the structure. The system was installed during the original construction of the building due to groundwater infiltration into the building basement.

PAC Investigations

Sampling conducted in early 1984 (17 ppm Aroclor-1260) indicated PCB levels in the cooling oil were less than the EPA regulatory limit of 50 ppm and, therefore, no corrective actions were taken at that time (DOE 1992). The gravel lining in the secondary containment was removed and the footing drain structure grouted closed prior to January 8, 1986. Service records document that the transformer was cleaned and repaired in August 1986 and retrofilled on September 20, 1986, with non-PCB-containing oil as part of a Sitewide transformer retrofill program. Residual staining on the transformer concrete pad was noted in January 1987, and it was suggested that the pad be coated with a sealant. Three water samples were collected and analyzed for PCBs from the associated manhole east of Building 111 on September 4, 1986 (Rockwell 1986). Results from the sampling indicated PCB concentrations in all three samples were less than 1 part per billion (ppb).

During a 1991 Plantwide investigation of PCB contamination, 14 wipe samples were collected from the 111-1 transformer. The samples were analyzed, using EPA Method 8080, by an off-site laboratory. All PCB sample results from exterior of the transformer and surrounding area were nondetect (EG&G 1991).

In September 2000, D&D sampling for the Building 111 cluster was conducted. Nine samples were collected in and around the 111-1 Transformer and the extended footing drain area. Analytical results for PCBs are shown in Table 2.17 of the 2001 HRR Annual Update (DOE 2001b). Characterization sampling included analysis for PCBs and other parameters at the following locations (DOE, 2000b):

- One water sample and two sludge samples from the parking lot manhole 30 ft east of Building 111 (outfall of footing drain);
- One sludge sample from the footing drain sump in the mechanical room;
- One sludge sample from the drain next to the elevator lift at the southeast corner of the building; and
- Four (2-inch-deep) concrete cores from the floor of the secondary containment surrounding the transformer.

The maximum concentration of PCBs identified from concrete cores in the secondary containment area (PAC 100-607) was 0.283 ppm Aroclor-1260. The maximum concentrations of PCBs identified in sludge from the associated sanitary drain manhole located 30 ft to the east of the building was 2.3 ppm Aroclor-1254 and 0.9 ppm Aroclor-1260 (Figure 2.7 and Table 2.17, DOE 2001b).

Maximum sludge sample concentrations of 2.5 ppm Aroclor-1016 and 4.1 ppm Aroclor-1254 were identified in a sample collected from the sump located in the mechanical room adjacent to the electrical room. A sludge sample collected from the storm drain located in the outer dock lift area had a maximum concentration of 3.3 ppm Aroclor-1254. These data indicate that PCB dielectric oil was contained within the containment system as originally designed.

Sampling was conducted within and adjacent to PAC 100-607 in accordance with the RLCP (DOE 2000b) The Reconnaissance Level Characterization Report/Predemolition Survey Report (RLCR/PDSR) (DOE 2000c) documented the results of the sampling prior to demolition and was

approved by the regulatory agencies. D&D of Building 111 and the transformer were completed on November 26, 2001 (DOE 2002c).

No Further Action Recommendation

The PCB characterization results for PAC 100-607 and other areas characterized in the Building 111 basement are less than the approved cleanup criteria of 25 ppm for PCBs. The D&D material disposition concentration level of 50 ppm was also met. Therefore, PAC 100-607 was proposed for NFA in accordance with RFCA (DOE et al. 1996) in an interim update to the 2001 HRR Annual Update submitted in April 2001 (DOE 2001a).

DOE received approval from CDPHE (the LRA) and EPA of NFA status for PAC 100-607 on April 12, 2001 (CDPHE and EPA 2001).

Comments

Groundwater was modeled to determine whether PCBs in paint from Building 111 were impacting groundwater. Results of the study indicted that because leaching of the PCBs from paint is very unlikely and PCBs are very immobile, there is no risk to human health or the environment. Additionally, groundwater monitoring downgradient of Building 111 is not necessary (DOE 2005).

References

CDPHE and EPA, 2001, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA RE: NFA Justification Document for the Building 111 Transformer Area (PAC 100-607), April 12.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1997, Closeout Report for the Source Removal of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden Colorado, July.

DOE, 2000a, Annual Update to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000b, Reconnaissance Level Characterization Plan (RLCP) for the Building 111 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000c, Reconnaissance Level Characterization Report/Predemolition Survey Report (RLCR/PDSR) for the Building 111 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001a, Interim Update to the Historical Release Report for PAC 100-607, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2001b, Annual Update to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Correspondence to M. Aguilar, EPA, Region VIII from J. Rampe, DOE, RFPO, September 7.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EG&G, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls, Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

Rockwell, 1986, Analytical Data for PCB Samples Collected from the Building 111 Manhole Sump, Lab #E86-3934, Rocky Flats Plant, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-608

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 131 Transformer Leak

This Final Update to the HRR for PAC 100-608 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-608 is summarized in this update. The following HRR volumes contain PAC 100-608 information:

Original Report – 1992 (DOE 1992);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

June 3, 1989

Historical Summary

The location of PAC 100-608 is shown on Figure 15. A pole-mounted electrical transformer located north of Building 131 leaked dielectric fluid (cooling oil) onto the asphalt surface beneath the pole. The cause of the leak was not identified in the documentation. Approximately 0.25 gallon of oil leaked from the transformer. The oil had been previously tested and found to contain 19 ppm PCBs (DOE 1992).

PAC Investigations

Because the release contained less than the 10 lb reportable quantity of PCBs and the material released contained less than the 50 ppm PCBs as regulated by EPA, no investigation or cleanup was initiated (DOE 1992). No documentation regarding repair or replacement of the transformer was found.

No Further Action Recommendation

Based on the following criteria, PAC 100-608 was proposed for NFA in the 1998 Annual Update to the HRR (DOE 1998) in accordance with RFCA (DOE et al. 1996):

- The PCB concentration in the dielectric oil was 19 ppm and was less than the approved cleanup criteria of 25 ppm documented in the Final PAM Remediation of PCBs (DOE 1995) for cleanup of PCB sites at RFETS (DOE 1997);
- The small quantity of the release (0.25 gallon); and
- The age of the release (June 1989).

DOE received approval of NFA status from CDPHE (the LRA) and EPA for PAC 100-608 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DPE RFFO, from S. Gunderson, CDPHE and T. Reheder, EPA RE: Annual Update for the Historical Release Report (September 1998), July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Environmental Technology Site, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1997, Closeout Report for the Source Removal of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden Colorado, July.

DOE, 1998, Annual Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 100-609

IHSS Number: Not Applicable
Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 100-5
Unit Name: Building 121 Security Incinerator

This Final Update to the HRR for PAC 100-609 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 100-609 is summarized in this update. The following HRR volumes contain PAC 100-609 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

December 1980 to 1985

Historical Summary

The location of PAC 100-609 is shown on Figure 15. The security incinerator was located south of Building 121 and was used for incineration of classified documents. During some period in its operating history, the incinerator was used to burn no carbon required (NCR)-type paper containing PCBs. It is known that ash from the incinerator was being disposed of at the Present Landfill (PAC NW-114) in December 1980. It is not known whether this was standard practice throughout the incinerator's operating history.

NCR paper, containing up to 10 to 20 percent PCBs, was burned in the incinerator. Dioxins and furans could potentially have been generated from incineration of this paper; however, no documentation was found detailing a release of contaminants from the operation of this incinerator.

PAC Investigations

The two slabs associated with PAC 100-609 were removed in accordance with RSOP Notification #02-01 (DOE 2002b). The main slab was 20 inches thick. One composite sample was collected from the concrete for waste characterization and analyzed for radionuclides, metals, dioxins, and furans. Concrete was recycled in accordance with the RSOP for Recycling Concrete (DOE 1999). After removal of the two slabs, surface soil samples were collected from six sampling locations beneath the incinerator concrete slab and analyzed in accordance with IASAP Addendum #IA-02-01 (DOE 2001).

All analytical results from soil sampling beneath the slab indicated PCB concentrations were less than RFCA Tier II (DOE et al. 1996) and WRW soil ALs (DOE et al 2003). Maximum PCB concentrations were Aroclor-1016 at 19.5 µg/kg, Aroclor-1221 was not detected, Aroclor-1232 was not detected, Aroclor-1242 at 23 µg/kg, Aroclor-1248 at 42 µg/kg, Aroclor-1254 at 30

µg/kg, and Aroclor-1260 at 17.5 µg/kg. Because there are no existing RFCA ALs for dioxin/furans, a different framework was used for comparison of analytical results. Both EPA cleanup guidelines (EPA 1998) for residential and industrial use (in accordance with RFCA) and a value of 9 parts per trillion (ppt) TEQs (consultative process) were used for comparison. Results for dioxin/furan were converted to TEQ using a TEF in accordance with SW8290 (EPA 1994) and a recent WHO (WHO 1998) study, and compared directly with the TEQ of 9 ppt. The TEQ values for dioxin and furan congeners were summed separately for each sampling location and compared to the TEQ of 9 ppt. There were no exceedances of 9 ppt for the separately summed dioxin or furan congeners. Results at one location indicated a value of 10.87 ppt when the dioxin and furan congeners were summed together. While this value is slightly higher than the reference value of 9 ppt, it, as well as all other summed TEQ values, are well within the cited Front Range background range of 0.1 to 155 ppt TEQ. The maximum concentration of dioxin and furan congeners is 290 parts per trillion (pg/g) of 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD).

Because all analytical results from sampling beneath the slab indicated dioxin and furan concentrations were less than EPA cleanup guidelines for residential use and PCB levels were less than RFCA Tier II ALs, no soil was removed. Results of the stewardship evaluation indicated further action is not necessary. The shape and location of this PAC was changed based on field information to reflect the actual location of the former incinerator.

No Further Action Recommendation

Based upon the removal of the two concrete slabs in accordance with ER RSOP Notification #02-01 (DOE 2002b) and subsequent sampling in accordance with IASAP Addendum #IA-02-01 (DOE 2001), no potential contaminant or residual contaminant source could be identified. Therefore, in accordance with RFCA (DOE et al. 1996), PAC 100-609 was proposed for NFA. After review of the Closeout Report for IHSS Groups 100-4 and 100-5 (DOE 2003b), DOE received approval from CDPHE (the LRA) of NFA status for PAC 100-609 on April 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE, RFFO, from S. Gunderson, CDPHE, RE: Final Closeout Report for IHSS Groups 100-4 and 100-5, April 18.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 1994, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Integrated Manual (SW-846), 3rd Edition, Office of Solid Waste and Emergency Response, September.

EPA, 1998, EPA Cleanup Guidelines for Residential and Industrial Use.

WHO, 1998, Assessment of the Health Risk of Dioxins: Re-Evaluation of the Tolerable Daily Intake (TDI), WHO European Center for Environment and Health, Geneva, Switzerland, May.

PAC REFERENCE NUMBER: 100-610

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Asbestos Release – Building 123

This Final Update to the HRR for PAC 100-610 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-610 is summarized in this update. The following HRR volumes contain PAC 100-610 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

February 9, 1987

Historical Summary

The location of PAC 100-610 is shown on Figure 15. A truck traveling west on Cottonwood Avenue, en route to Building 123, Door 5, hit overhead steam and air pipes while taking a right-hand turn on a driveway south of Building 123. The steam pipes were insulated with asbestos. This incident involved disturbing approximately 12 linear feet of overhead pipe with asbestos insulation.

Response activities included barricading Third Street and Cottonwood Avenue, wetting down the asbestos on the truck and surrounding ground, transporting the truck to Building 331 for further decontamination, and repair of the overhead pipes. Personnel conducted air monitoring during the response activities. The spill was on the asphalt.

PAC Investigations

No investigation was necessary because the spill was on asphalt and was cleaned up.

No Further Action Recommendation

PAC 100-610 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. A NFA was justified because the release was on asphalt and it was cleaned up. An NFA was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

According to the site visit conducted on December 11, 1991, the incident location was approximately 105 ft east of Third Street near the Building 123 driveway and Cottonwood Avenue intersection.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-611

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 100-4
Unit Name: Building 123 Scrubber Solution Spill

This Final Update to the HRR for PAC 100-611 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-611 is summarized in this update. The following HRR volumes contain PAC 100-611 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

November 7, 1989

Historical Summary

An inoperative pump in the Building 123 process waste transfer system caused the Building 123 scrubber system to overflow, spilling scrubbing solution into a bermed area outside the building and into three pits beneath the floor of the building. The location of PAC 100-611 is shown on Figure 15. Also, approximately 5 gallons of liquid were present in and around a nearby stormwater drainage ditch that served the Building 123 parking lot. It was speculated that this liquid leaked from the berm wall interface with the underlying asphalt. However, it was later concluded that this liquid was not associated with the incident (that is, it was in the ditch prior to the incident).

Under normal operating conditions, the scrubbing solution drained into the process waste system when the scrubbing process was completed. The spill occurred because waste pump switches were in the wrong position, and the influent valve was blocked by glass filtering wool from Building 123. Normal scrubbing solution drainage was restored when the glass wool material was cleared and the inoperative process waste pump was restarted.

A submersible pump was used to transfer the scrubbing solution from the bermed area to process waste drains in Building 123. Measures were proposed to prevent the subsequent buildup of glass wool in the process waste system. An RCRA CIPR (89-019) was written (DOE 1992). All spilled materials were contained within secondary containment structures and transferred into the Building 123 process waste system for eventual treatment at Building 374 (DOE 1992).

The scrubbing solution consisted primarily of water, which was used to scrub nitric acid, hydrofluoric acid, and hydrochloric acid used in Building 123. Approximately 50 gallons were released to the bermed area, and several hundred gallons were contained in the three pits beneath the Building 123 floor.

PAC Investigations

Analyses indicated the solution in the bermed area had a pH of 1.6, and the solution in the three pits had a pH of 6.0. The 5 gallons of liquid in the parking lot drainage ditch did not react when sodium bicarbonate was applied, indicating it was not acidic and, therefore, was not the scrubbing solution.

Five surface soil samples were collected at PAC 100-611 on February 5, 2002, and analyzed for pH in accordance with IASAP Addendum #IA-02-01 (DOE 2001). Sampling results indicated remediation was not required (DOE 2003b) because pH values ranged from 8.4 to 8.8. PAC 100-611 was located at the southwestern end of the eastern portion of UBC 123 and within IHSS 100-148. Because of the extensive UBC 123 excavation, most of the PAC 100-611 area was excavated and all of the area was regraded.

No Further Action Recommendation

Based upon the characterization sample results collected in accordance with IASAP Addendum #IA-02-01 (DOE 2001), no potential contaminant or residual contaminant source could be identified (DOE 2003b). Therefore, in accordance with RFCA (DOE et al. 1996), PAC 100-611 was proposed for NFA. DOE received approval from CDPHE of the NFA status for PAC 100-611 on April 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE, RFFO, from S. Gunderson, CDPHE, RE: Final Closeout Report for IHSS Groups 100-4 and 100-5, April 18.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Annual Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update to the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 100-612

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Battery Solution Spill - Building 119

This Final Update to the HRR for PAC 100-612 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-612 is summarized in this update. The following HRR volumes contain PAC 100-612 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

July 9, 1991

Historical Summary

The location of PAC 100-612 is shown on Figure 15. A nickel-cadmium battery fell from a pallet of used batteries onto the pavement adjacent to the southeastern corner of Building 119. Approximately 3 quarts of potassium hydroxide battery solution spilled onto the pavement.

Upon discovery of the spill, the battery was placed upright and the HAZMAT team responded, contained the spill, cordoned off the area, cleaned up the spill using Oil-Dri, and placed the residue in a drum for disposal. A sample of the battery solution was taken for laboratory analysis.

The spill was confined to the pavement area which prevented any migration to groundwater or surface water. The spilled battery solution was cleaned from the pavement and placed in a drum for disposal. The drum containing the battery solution residue and cleanup supplies was transferred to RCRA Storage Unit #1 until shipment for off-site disposal.

PAC Investigations

Solution from another battery used in the same system was analyzed. The specific gravity and pH of the solution analyzed were 1.23 and 14, respectively. The analytical results for cadmium and chromium in the solution were 4.9 mg/L and 7.2 mg/L, respectively. Arsenic was detected at 3.9 mg/L and selenium at 0.86 mg/L.

No Further Action Recommendation

PAC 100-612 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. An NFA was justified because the spill was confined to the pavement area which prevented migration to soil, surface water, and groundwater. A NFA was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE, RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA, RE Approval Letter for NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 100-613

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Asphalt Surface in Lay Down Yard North of Building 130

This Final Update to the HRR for PAC 100-613 consolidates the initial information provided in the Fourth Quarterly Update to the HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 100-613 is summarized in this update. The following HRR volumes contain PAC 100-613 information:

Update Report – Fourth Quarterly (DOE 1993);
Update Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

March 18, 1993

Historical Summary

Three used, lead-acid batteries fell from a pallet while being transported from a weigh scale on the northern side of Building 130 to a multipurpose receiving and storage yard on the southern side of Building 130. The location of PAC 100-613 is shown on Figure 15. The first battery fell when the forklift hit a bump. The forklift driver could not see the fallen battery and drove over it, resulting in another jolt during which two more batteries fell off the pallet. The first battery was crushed and the other two were overturned, resulting in a 2 ft by 15 ft spill of sulfuric acid on the asphalt and sulfuric acid on the forklift's front wheels and forks.

PAC Investigations

The forklift operators (who were wearing personal protective equipment [PPE]) restored the fallen batteries to an upright position. The HAZMAT team roped off the area and all personnel near the incident and within 300 ft upwind were evacuated. pH measurements taken of the spill solution showed a value of 0. Approximately 5 gallons of sodium bicarbonate was placed on the spill, as well as on the forklift's front wheels and forks. The waste materials from the crushed battery were picked up, double-bagged, and placed into a five-gallon U.S. Department of Transportation (DOT)-approved drum which was stored in a RCRA 90-day accumulation area. The two damaged batteries were placed into a 20-gallon "lab-pack" and returned to the pallet. The HAZMAT equipment was decontaminated with water to a pH of 7. This water was pumped to drums to await treatment in Building 374.

Based on previous analyses of the same type of batteries, the spill was characterized as approximately 2 to 4 quarts of sulfuric acid and lead. These analyses identified lead concentrations in the acid at up to 20 ppm.

No Further Action Recommendation

PAC 100-613 was addressed through the consultative process in a NFA Working Group meeting on February 27, 2002. A NFA was justified because the release was to the asphalt surface and it was cleaned up. A NFA was verbally agreed to in the February 27, 2002 meeting and formally approved by CDPHE (the LRA) and EPA in a letter dated September 26, 2002 (CDHPE and EPA 2002).

Comments

This PAC was formerly identified as PAC 000-501 in the Fourth Quarterly Update (DOE 1993). It was renumbered in the Seventh Quarterly Update (DOE 1994) to better reflect its location on the PAC map.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.









DOE, 1993, Fourth Quarterly Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

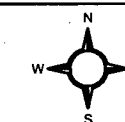
DOE, 1994, Seventh Quarterly Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2002, Annual Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Figure 16
HRR 300 Area
IHSSs and PACs

KEY

-  Stream
-  Dirt road
-  PAC
-  IHSS
-  HRR area
-  Lake
-  Asphalt
-  Building



200 0 200 Feet

Scale = 1: 3600

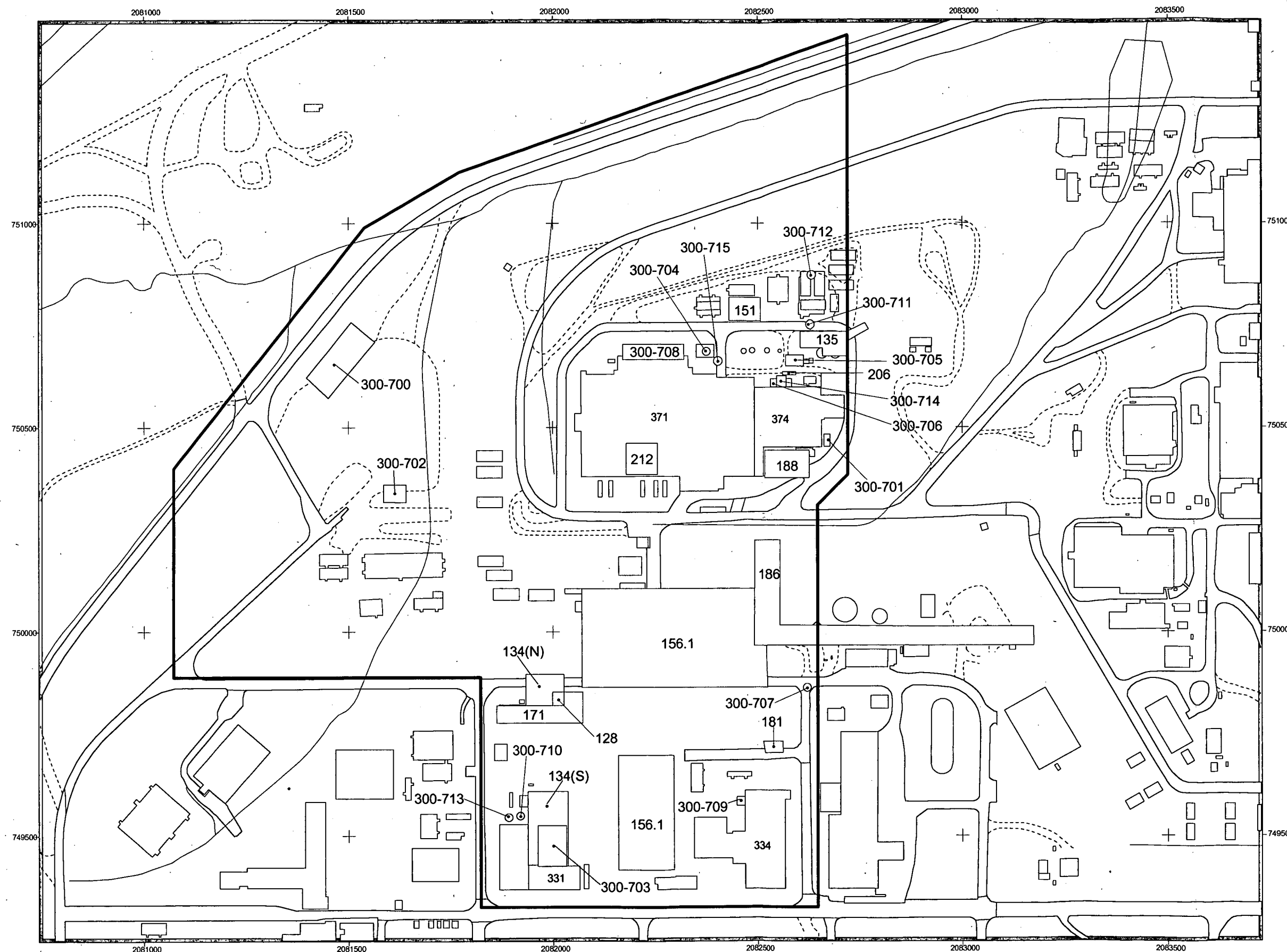
State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Date: 09.28.05



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PAC REFERENCE NUMBER: 300-128

IHSS Number: 128
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 300-1
Unit Name: Oil Burn Pit No. 1

This Final Update to the HRR for PAC 300-128 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 128 is summarized in this update. The following HRR volumes contain IHSS 128 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

August 18, 1956

Historical Summary

IHSS 128 is located northeast of Building 335 and south of Sage Avenue. As indicated on Figure 16, IHSS 128 is contained within two larger PACs 300-134N and 300-171. IHSS 171 was used for various fire training exercises that included burning metals, fuels, and solvents.

On August 18, 1956, an experiment was conducted that involved burning contaminated oil from Buildings 444 and 881 in an area referred to as the garage oil-burning pit (IHSS 128). Barrels were dumped on the southern side of the pit and ignited. At one point rocks were thrown into the oil to agitate the surface to facilitate burning. Reports documenting the incident conflict on the exact amount, but between 6 and 10 drums of waste oil were burned that day (DOE 1992a).

Prior to the burning, several high-volume air samplers were started to obtain background data; however, not all the samplers were started at the same time, and several were not started for approximately 1 hour after the fire had been initially ignited. The report also documents the refueling and failure of a generator that was powering many of the samplers. One sampler was placed in the path of a "black plume," which was moving at a 30-degree angle and rising to a height of 40 to 100 ft. The plume moved in the general direction of Building 123 (DOE 1992a).

Monitoring results from the air samplers yielded alpha radiation readings ranging from 0.1 disintegrations per minute per square meter (dpm/m²) to 30 dpm/m². The low reading was taken from the roof of Building 123, and the high reading was taken approximately 60 ft south of the burning pit directly in the smoke plume (DOE 1992a).

A direct survey was conducted of the soil and oil residue within the pit. Two spots along the southern bank of the pit where the oil was dumped had readings of 500 and 750 cpm alpha activity. Soil samples were collected; however, the results are unknown (DOE 1992a).

After burning, the residue was left in place, and the pit was backfilled. It is not known when the backfilling took place. The residues were not removed prior to further construction in the area (DOE 1992a).

IHSS Investigations

One surface soil sample and one soil gas sample were collected in IHSS 128 in accordance with the OU 13 RFI/RI Work Plan (DOE 1992b). The soil gas sample was analyzed for VOCs and the only analyte detected was trichlorofluoromethane at 1.9 µg/L. Soil gas samples collected in the immediate area outside IHSS 128 contained chlorinated solvents and benzene, toluene, ethylbenzene, and xylenes (BTEX). These detections were attributed to solvent and fuel burning as part of firefighter training exercises at IHSS 128 and the surrounding IHSSs (DOE 1995). The surface soil sample collected in IHSS 128 was analyzed for lithium, magnesium, and radionuclides. All results were less than background levels (DOE 1995).

A RFCA (DOE et al. 1996) accelerated action was conducted at IHSS 128 as part of IHSS Group 300-1, in accordance with IASAP Addendum #IA-02-01 (DOE 2001) and ER RSOP Notification #02-10 (DOE 2002; CDPHE 2002). Accelerated action characterization sampling at IHSS 128 included one biased sampling location in the approximate center of the IHSS that was analyzed for radionuclides and SVOCs, and one statistical sampling location at the southern edge of the IHSS that was analyzed for radionuclides, metals, SVOCs, and VOCs. Two additional statistical samples were collected near IHSS 128, within 10 ft of its northern and eastern boundaries. The sample near the northern boundary was analyzed for radionuclides and metals, while the sample near the eastern boundary was analyzed for radionuclides, metals, SVOCs, and VOCs. The variability in analytical suites is due to the overlap of IHSS 128 with IHSS 134N and IHSS 171. Radionuclides and SVOCs are the analyte groups relevant to IHSS 128. Results were uniformly below RFCA WRW soil ALs (DOE et al. 2003). Maximum radionuclide activity was detected for uranium-235 at 0.21 pCi/g; the WRW soil AL is 8 pCi/g. Maximum volatile organic concentrations for benzo(a)pyrene and fluoranthene were 280 and 760 µg/kg, respectively. WRW soil ALs for benzo(a)pyrene and fluoranthene are 3,490 and 27,200,000 µg/kg, respectively. Based on the results of accelerated action sampling, no remediation was required within IHSS 128. Details and analytical results are provided in the Final Closeout Report for IHSS Group 300-1 (DOE 2003b).

No Further Accelerated Action Recommendation

Based on the soil characterization results, there were no constituents in the IHSS at concentrations greater than WRW soil ALs. The SSRS conducted as part of the accelerated action further indicated NFAA was justified. The IHSS is not located in an area susceptible to landslides or high erosion.

DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS Group 300-1 on June 20, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2002, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE RE: Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-10, October 24.

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE, Final Closeout Report for IHSS Group 300-1, June 20.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, Rocky Flats Plant 100 Area, Operable Unit 13, October.

DOE, 1995, Data Summary 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Closeout Report for IHSS Group 300-1, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBERS: 300-134N AND 300-134S

IHSS Numbers: 134N and 134S
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Groups: 300-1 and 300-2
Unit Names: Metal Disposal Site North Area (IAG Name: Lithium Metal Destruction Site), and Reactive Metal Destruction Site South Area

This Final Update to the HRR for PACs 300-134N and 300-134S consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The dispositions of IHSSs 134N and 134S are summarized in this update. For ease of understanding, each IHSS is described separately below.

IHSS 134N

The following HRR volumes contain IHSS 134N information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1963 to 1970

Historical Summary

Reactive metal disposal associated with fire training was conducted north of Building 331. IHSS 134N is north of and beneath portions of former Building 335. The location of IHSS 134N is illustrated on Figure 16.

Many documents indicate lithium was burned in this area; however, interviews with RFETS Fire Department employees present during these activities contradict this information. They indicated, although some small amounts of lithium may have been destroyed at this location, magnesium was the primary constituent of concern. EPA aerial photographs reveal the presence of two pond-like structures roughly 250 ft north of Building 331. IHSS 134N was originally located in a depression north of Building 331 and west of Building 553. IHSS 134N is approximately 300 ft north of Building 331 and may be the location of one of the pond-like structures. Documents describing the operations indicate various sizes of ponds (DOE 1992a). Sage Avenue was constructed over part of the area during the late 1960s and early 1970s.

Photographs taken in 1966 show a white residue coating the depression where the metal destruction took place. Other photos taken from a distance show a dense black cloud coming from this area. It is not known whether the smoke plume was the result of metal destruction or a grass fire, which was often caused by burning activities (DOE 1992a).

Lithium was originally burned by placing it on the ground and sprinkling it with water. Sometimes magnesium chips or fuel, such as gasoline, were used as initiators. The exact amount of lithium disposed at IHSS 134N as a distinct disposal area is not documented; however, Rocky

Flats records indicate by 1970 approximately 400 to 500 lb of metallic lithium were burned and their residues buried. This quantity is thought to be a combination of lithium disposal that took place at this site and at two other sites (PAC 300-134S and 900-140). The waste lithium originated in Buildings 444 and 881 and was not radioactively contaminated (DOE 1992a).

IHSS Investigations

OU 13 RFI/RI activities at IHSS 134N included soil gas sampling and surface soil sampling in accordance with the OU 13 RFI/RI Work Plan (DOE 1992b). In addition, a sludge sample was collected in IHSS 134N at a location where sludge was encountered during soil gas sampling (DOE 1992b).

Soil gas was sampled at 15 locations in IHSS 134N. VOCs were detected in approximately 60 percent of all the samples associated with IHSS 134N. The detected analytes included chlorinated solvents, BTEX, acetone, and chlorofluorocarbons. The presence of these analytes was attributed to the burning of spent solvents, oil, and fuel in this area for firefighter training (DOE 1995).

Surface soil samples were collected at three locations in IHSS 134N. All three were analyzed for radionuclides, and one of these was also analyzed for metals. Americium-241, plutonium-239/240, and lithium were present at concentrations exceeding background means plus two standard deviations (DOE 1995).

The sludge sample collected in IHSS 134N contained 100,000 µg/L tetrachloroethene, as well as lesser amounts of other chlorinated solvents. Cadmium, nickel, and zinc were present in the sludge at concentrations greater than background levels (DOE 1995). The detection of 100,000 µg/L TCE in an OU 13 sludge sample is less than the RFCA WRW soil AL for TCE (615,000 µg/kg).

A RFCA (DOE et al. 1996) accelerated action was conducted at IHSS 134N as part of IHSS Group 300-1, in accordance with IASAP Addendum #IA-02-01 (DOE 2001) and ER RSOP Notification #02-10 (DOE 2002; CDPHE 2002). Accelerated action characterization sampling at IHSS 134N included two biased surface soil sampling locations and seven surface soil statistical locations within the boundaries of the IHSS. Seven of these samples were analyzed for radionuclides and metals. One location, sampled in the area of overlap with IHSS 128, was analyzed for radionuclides and SVOCs, and one location on the boundary with IHSS 171 was analyzed for radionuclides, metals, SVOCs, and VOCs. Results for these samples were uniformly below RFCA WRW soil ALs (DOE 2003b; DOE et al. 2003). Maximum radionuclide activity of plutonium-239/240 was 4.86 pCi/g and iron was detected at a maximum concentration of 53,100 mg/kg. Based on the results of accelerated action sampling, no soil remediation was necessary in IHSS 134N. RFCA (DOE et al. 1996) accelerated action activities at this IHSS were limited to the removal of an approximately 88-ft² equipment slab located in the southwestern portion of the IHSS, immediately north of Building 335. Details and analytical results are provided in the Final Closeout Report for IHSS Group 300-1 (DOE 2003b).

No Further Accelerated Action Recommendation

Based on the OU 13 and accelerated action data, accelerated actions taken, and the SSRS (DOE et al. 2003) conducted as part of the accelerated action, NFAA was justified for IHSS 134N.

DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS Group 300-1 on June 20, 2003 (CDPHE 2003).

IHSS 134S

The following HRR volumes contain IHSS 134S information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1963 to 1970

Historical Summary

Reactive metal disposal and firefighting training was conducted at IHSS 134S, located in the corner formed by the L-shape of former Building 331. Part of the roof and adjacent parking lot are included. This location is illustrated on Figure 16. Activities at IHSS 134S are not easily differentiated from activities at IHSS 134N because documentation conflicts with interviewee statements. IHSS 134S is in the L-shaped corner of Building 331 and the parking lot to the north. RFETS Fire Department personnel indicate lithium destruction took place in this area (DOE 1992a).

Lithium was originally burned by placing it on the ground and sprinkling it with water. Sometimes magnesium chips or fuel, such as gasoline, were used as initiators. The use of this location for disposal of lithium on the ground was discontinued because a fireman was injured during lithium disposal activities on October 13, 1966. However, lithium burning in drums at the adjacent Building 331 parking lot is documented as late as 1969. On September 5, 1969, lithium was being burned inside a barrel when it exploded, causing lithium to be dispersed in the Building 331 parking lot and onto the roof of Building 331.

The exact amount of lithium disposed at IHSS 134S as a distinct disposal area is not documented; however, Rocky Flats records indicate by 1970 approximately 400 to 500 lb of metallic lithium were burned and their residues buried. This quantity is thought to be a combination of lithium disposal that took place at this site and at two other sites (IHSS 134N and IHSS 140). The waste lithium originated in Buildings 444 and 881 and was not radioactively contaminated (DOE 1992a).

IHSS Investigations

Soil gas and surface soil sampling were conducted at IHSS 134S in accordance with the OU 13 RFI/RI Work Plan (DOE 1992b).

Soil gas was sampled at 33 locations in and near IHSS 134S. VOCs were detected in approximately 60 percent of all the samples associated with the IHSS. The analytes detected included chlorinated solvents, BTEX, acetone, and chlorofluorocarbons. The presence of these analytes was attributed to the burning of spent solvents, oil, and fuel in this area for firefighter training (DOE 1995).

Surface soil samples were collected at 11 locations in IHSS 134S and were analyzed for radionuclides and lithium. All results were less than background means plus two standard deviations except for americium-241, plutonium-239/240, and uranium-235 (DOE 1995).

Accelerated action characterization was conducted at IHSS 134S as part of IHSS Group 300-2, in accordance with IASAP Addendum #IA-03-08 (DOE 2003c). Accelerated action characterization sampling at IHSS 134S included 11 statistical and 16 biased soil sampling locations. Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. The only results that exceeded RFCA WRW soil ALs (DOE et al. 2003) were benzo(a)pyrene in surface soil at three sampling locations and dibenz(a,h)anthracene at 3,500 µg/kg at one location. The maximum detection was 17,000 µg/kg. The maximum concentrations of other prominent contaminants in surface soil include 87 mg/kg of lead and 68 mg/kg of chromium. The maximum activities of radionuclides in surface soil were 0.852 pCi/g americium-241, 4.856 pCi/g plutonium-239/240, 2.253 pCi/g uranium-234, 0.467 pCi/g uranium-235, and 5.739 pCi/g uranium-238. In subsurface soil, maximum concentrations of metal included 170 mg/kg lead. VOCs were either not detected or detected very close to detection limits. Maximum radionuclides in subsurface soil were 5.612 pCi/g uranium-234, 0.181 pCi/g uranium-235, and 5.612 pCi/g uranium-238. As documented in the Data Summary Report, no soil remediation was required in IHSS Group 300-2 following accelerated action sampling (DOE 2004).

In accordance with the consultative process (RCR dated December 2, 2004) the location with the benzo(a)pyrene detection of 17,000 µg/kg in surface soil was excavated during the removal of overlying asphalt in March, 2005. Three samples were collected from the excavation. After soil removal, benzo(a)pyrene concentration ranged from 460 µg/kg to 11,000 µg/kg. The maximum benzo(a)pyrene concentration was less than three times the WRW soil AL.

No Further Accelerated Action Recommendation

Based on the OU 13 data, the accelerated action characterization sampling data, and the SSRS (DOE et al. 2003), NFAA was justified for IHSS 134S.

DOE received approval of the NFAA status for IHSS Group 300-2 on December 1, 2004, in the form of CDPHE (the LRA) approval (CDPHE 2004) of the Data Summary Report for IHSS Group 300-2 on December 17, 2004. (DOE 2004).

Comments

None

References

CDPHE, 2002, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE, RE: Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-10, October 24.

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO from S. Gunderson, CDPHE, RE: Final Closeout Report for IHSS Group 300-1, June 20.

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE, Draft Data Summary Report for IHSS Group 300-2 UBC-331 (Maintenance) and IHSS 300-134(S) (Lithium Metal Destruction Site), December 17.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, Rocky Flats Plant 100 Area, Operable Unit 13, October.

DOE, 1995, Data Summary Report for No. 2 Operable Unit 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Closeout Report for IHSS Group 300-1, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003c, Industrial Area Sampling and Analysis Plan Addendum #IA-03-08, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004, Final Data Summary Report for IHSS Group 300-2, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 300-135

IHSS Number: 135
Current Operable Unit: Not Applicable
Former Operable Unit: 8
IHSS Group: Not Applicable
Unit Name: Cooling Tower Blowdown

This Final Update to the HRR for PAC 300-135 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 135 is summarized in this update. The following HRR volumes contain IHSS 135 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1980 to 1982

Historical Summary

IHSS 135 consists of a former pond area and culvert where cooling tower blowdown was discharged. The location of IHSS 300-135 is indicated on Figure 16.

Aerial photographs indicated the Building 373 Cooling Tower was present as early as 1978. Water from the Cooling Tower was allowed to drain into Walnut Creek as late as October 1979 (DOE 1992). A June 1, 1980 aerial photograph indicated a pond-like structure north of Building 374 where Tanks 808A and 808B were later located. The feature was identified in utility drawings as the Cooling Tower retention pond. The drawings indicated a sluice gate at the northeastern corner of the pond with a connecting culvert extending to the northeast (DOE 1992). Interviewees for the CEARP Phase I document indicated the retention pond was located south of Building 374; however no documents could be found to support this, and no cooling towers have ever been located in that area (DOE 1992).

The first documented use of the Building 373 Cooling Tower pond was on June 12, 1981, when the cooling tower was cleaned and the blowdown was pumped into a small retention pond. During the night, some of the water leaked through the dirt dike and gate valve and drained into Walnut Creek. In response to this incident, a new gate valve was installed (DOE 1992).

Chromate was typically added to cooling water as a corrosion inhibitor until the late 1970s, when phosphate compounds were substituted (DOE 1992). Because the switch from chromate to phosphate occurred in the same time period as the initiation of activity at the Building 373 Cooling Tower, it is possible the chromate was present in the cooling water blowdown. Analysis of the water from the above incident resulted in no detectable quantities of phosphates. It is possible that prior to use of the pond, effluent from the Cooling Tower may have contained tritium (DOE 1992).

IHSS Investigations

In accordance with the OU 8 RFI/RI Work Plan (DOE 1994), surface soil in IHSS 135 was sampled at five locations and samples were analyzed for metals, radionuclides, and total petroleum hydrocarbons (TPH). Americium-241, plutonium-239/240, copper, molybdenum, and zinc were all detected in excess of their background means plus two standard deviations. Maximum values are americium-241 at 0.12 pCi/g, plutonium-239/240 at 0.74 pCi/g, copper at 65.2 mg/kg, molybdenum at 4.8 mg/kg, and zinc at 146 mg/kg. Chromium was not detected at levels exceeding background means plus two standard deviations (DOE 1995).

No Further Accelerated Action Recommendation

Based upon the sampling results, the total cumulative risk to human receptors from this site was deemed negligible. Based on the RFCA Attachment 6 criteria (DOE et al. 1996), NFA was recommended for IHSS 135 (DOE 1997).

After a review of IHSS 135 information presented in the HRR 1997 Annual Update by regulatory agencies, DOE received approval from CDPHE (the LRA) and EPA of the NFAA status for IHSS 135 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary No. 2 Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 300-151

IHSS Number: 151
Current Operable Unit: Not Applicable
Former Operable Unit: 8
IHSS Group: Not Applicable
Unit Name: Tank 262 Fuel Oil Spills (IAG Name: Fuel Oil Leak)

This Final Update to the HRR for PAC 300-151 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 151 is summarized in this update. The following HRR volumes contain IHSS 151 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1981 to 1988

Historical Summary

Tank 262 was a 47,500-gallon underground diesel storage tank located north of Buildings 371 and 374. It was installed in 1980 and is overlain by a 15- by 25-ft concrete pad. The location of IHSS 151, which consists of the area impacted by spills from this tank, is shown on Figure 16.

The first documented spill was on August 12, 1981, when approximately 196 gallons of No. 2 diesel fuel were spilled on the ground north of Building 374 (DOE 1992). The spill area was approximately 30 by 35 ft, and an estimated 400 cy of soil were affected. One reference stated the spill did not reach a water course. A report at the time of the incident indicated cleanup would be initiated when the ground dried (DOE 1992). A site visit conducted for the OU 8 Phase I RFI/RI Work Plan (DOE 1994) indicated only small areas of staining 1 to 3 ft in diameter remained around the pad, suggesting the area had been cleaned up after the 1981 spill.

A second spill released 50 gallons of diesel fuel in July 1982, and in October of the same year 32 gallons were spilled. No environmental impact was expected from the 50-gallon spill and no cleanup is documented. The diesel recovered from the 32-gallon spill for dust suppression on site roads (DOE 1992).

Another spill of 10 to 20 gallons occurred in September 1988 when a vent was left open during routine system circulation. The State Oil Inspector was notified and cleanup of adjacent saturated soil is documented (DOE 1992).

In accordance with RFCA Attachment 13, Tank 262 was drained and filled with polyurethane foam in September of 2002. The tank was not removed because it is at least 3 ft below the ground surface.

IHSS Investigations

In accordance with the OU 8 RFI/RI Work Plan (DOE 1994), IHSS 151 was sampled in five locations for TPH, metals, and BTEX. Soil gas sampling revealed one detection of trichlorofluoromethane at a very low ppb range. TPH was not detected. Some metals were detected in surface soil including arsenic at 4.8 mg/kg, beryllium at 0.74 mg/kg and copper at 22.75 mg/kg (DOE 1995). There were no other detections of hydrocarbon contaminants (or any other contaminants), supporting the conclusion that past diesel fuel spills were adequately cleaned up.

No Further Accelerated Action Recommendation

OU 8 RFI/RI sampling data for IHSS 151, described above, indicate historic spills at this site were adequately remediated. The IHSS was therefore proposed for NFA, consistent with the RFCA Attachment 6 criteria (DOE et al. 1996) for NFA decisions (DOE 1997).

After a review of IHSS 151 information presented in the HRR 1997 Annual Update by regulatory agencies, DOE received approval from CDPHE (the LRA) and EPA of the NFAA status for IHSS 151 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Operable Unit 8, Data Summary Report, 700 Area, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 300-156.1

IHSS Number: 156.1
Current Operable Unit: Not Applicable
Former Operable Unit: 14
IHSS Group: Not Applicable
Unit Name: Building 371 Parking Lot (IAG Name: Building 334 Parking Lot)

This Final Update to the HRR for PAC 300-156.1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 156.1 is summarized in this update. The following HRR volumes contain IHSS 156.1 information:

- Original Report – 1992 (DOE 1992a);
- Update Report – 1997 Annual (DOE 1997);
- Update Report – 2000 Interim (DOE 2000a);
- Update Report – 2000 Annual (DOE 2000b);
- Update Report – 2001 Annual (DOE 2001); and
- Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1969(?) to February 1973

Historical Summary

Historical records and employee interviews indicated a pile of radioactively contaminated soil of uncertain origin was present either west of Building 334 or south of the location where Building 371 was later built. Although employee interviews place the pile west of Building 334, aerial photographs indicate it was probably located in the area where the Building 371 parking lot was later constructed, and was present as early as 1969. Both areas are indicated as IHSS 156.1 on Figure 16 (DOE 1992a).

Some of the soil reportedly originated from construction of an addition to Building 774 or from the removal of underground tanks at Building 774. An interview with a former employee on December 6, 1991, revealed that some of the soil might have originated at Building 707 (DOE 1992a).

In February 1973, the soil, estimated to be 250 cy, was moved to an area east of the Swinerton and Walberg (S&W) contractor storage yard (PAC 900-165). The soil was sampled and analyzed prior to the move, yielding 3 to 704 dpm/g (DOE 1992). A former employee recalled that some of the soil might have been transported to north and west of Building 559 until the area was eventually leveled out (DOE 1992). This augments CEARP Interview Notes that state the soil was spread out over the hillside southeast of where Building 374 is located (DOE 1992a).

IHSS Investigations

In accordance with the OU 14 RFI/RI Work Plan (DOE 1992b), IHSS 156.1 was investigated. Because of the uncertainty in the location of this unit, both the area west of Building 334 and the

Building 371 parking lot area were investigated. A total of 42 samples were collected in the Building 371 parking area and the smaller area west of Building 334. Based on historical knowledge, the samples were analyzed for radionuclides. Nine radionuclide detections slightly exceeded the background means plus two standard deviations. The maximum detected activity of plutonium-239/240 was 0.16 pCi/g, which is less than the resident PPRG of 2.5 pCi/g. The maximum detected activity of americium-241 was 0.039 pCi/g, which is well below the resident PPRG of 1.9 pCi/g (DOE 1995, 2000a).

No Further Accelerated Action Recommendation

All OU 14 RFI/RI analytical data for IHSS 156.1 were less than the established PPRGs (DOE 1995). As agreed upon in a meeting held May 18, 2000 with the regulatory agencies, no contaminant source was indicated. Therefore NFA was proposed.

DOE received approval from CDPHE (the LRA) and EPA of the NFAA status for IHSS 156.1 on February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Workplan Operable Unit No. 14 Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Data Summary No. 1 Operable Unit No. 14 Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1997, Historical Release Report 1997 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000a, Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998, and 1999), Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2000b, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 300-171

IHSS Number: 171
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 300-1
Unit Name: Fire Department Training Ground (IAG Name: Solvent Burning Ground)

This Final Update to the HRR for PAC 300-171 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 171 is summarized in this update. The following HRR volumes contain IHSS 171 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1969 to 2003

Historical Summary

IHSS 171 covers approximately one-quarter of an acre and includes the area beneath Building 335, as well as areas to the southeast and northeast. IHSS 171 contains all of the area included in PAC 300-128 and overlaps PAC 300-134N. Figure 16 shows the locations of these IHSSs and illustrates these relationships.

Building 335 was used for training Fire Department personnel. The original, prefabricated building was placed after the 1969 fire at Building 776. Experiments took place to test the effects of heat and water on different types of materials (for example, filter plenums). Some exercises were conducted inside the building and provided a smoky, cramped, firefighting experience (DOE 1992a).

When this area was first used for training purposes, magnesium chips coated with a water-soluble material were burned, along with diesel fuel, gasoline, and possibly waste solvents. On June 9, 1972, steel beams were tested in a fire created by burning diesel oil in an open pit. Other types of training included the use of a large cross-shaped pan or a smaller square pan in which diesel fuel was burned. Most of the fuel was consumed; however, some was allowed to remain in the pan and mix with rainwater, and the mixture was eventually dumped on the ground (DOE 1992a).

On December 11, 1990, the large cross-shaped pan was found to have holes in it and oil-contaminated soil was present around the pans. The contamination was thought to have spread to a nearby storm drain catch basin where an oily sheen could be seen on the surface of standing water. Running water in a nearby ditch reportedly had no visible sheen. It was uncertain whether the sheen in the catch basin was related to firefighter training activities or to the presence of an 18,000-gallon gasoline underground storage tank (UST) approximately 250 ft south of the catch basin (DOE 1992a).

Later exercises involved the use of a "tree" constructed of metal tubing that allowed propane to escape from the "branches" of the tree. The propane was ignited and firefighters extinguished the resulting fires with a large quantity of water, which drained from the area into the storm drain system (DOE 1992a).

At a site visit conducted on November 21, 1991, the cross-shaped pan was present but covered. The water standing in the catch basin had an oily sheen on the surface, as observed during the 1990 inspection. There was no evidence of soil contamination. A black residue was observed along the top of the large, east-facing door of Building 335 (DOE 1992a).

IHSS Investigations

IHSS 171 was investigated in accordance with the OU 13 RFI/RI Work Plan (DOE 1992b), and seven surface soil samples were collected within the IHSS boundaries. Based on site history, all seven of the samples were analyzed for radionuclides, and five were also analyzed for lithium and magnesium. All results were less than the applicable PPRGs (DOE 1995). The maximum detected concentration of magnesium, americium-241, and plutonium-239/240 exceeded the background mean plus two standard deviations for surface soil (DOE 1995).

RFCA (DOE et al. 1996) accelerated action activities were conducted at IHSS 171 as part of IHSS Group 300-1 in accordance with IASAP Addendum #IA-02-01 (DOE 2001) and ER RSOP Notification #02-10 (DOE 2002; CDPHE 2002). Accelerated action sampling in IHSS 171, included 16 sampling locations within and immediately adjacent to the IHSS. The samples were analyzed for radionuclides, metals, and SVOCs in the 0- to 0.5-ft and 0.5- to 2.5-ft intervals, and for VOCs in the subsequent sampling intervals down to 10.5 ft. The only result that exceeded the RFCA WRW soil ALs (DOE et al. 2003) was arsenic (29.3 mg/kg) in subsurface soil (0.5 to 2.5 ft), at a sampling location approximately 15 ft south of Building 335. Based on the RFCA SSRS (DOE et al. 2003), soil at this location did not require accelerated action (RCR dated December 17, 2003). Accelerated action activities at this IHSS were limited to removal of the Building 335 slab and foundation walls, removal of all drain lines less than 3 ft below grade, removal of a corrugated metal sump, and removal of electric lines. Residual data indicated the maximum radionuclide activity of plutonium-239/240 was 3.48 pCi/g and the maximum arsenic concentration was 19 mg/kg in surface soil. Historical and accelerated action data and all remedial activities are documented in the Final Closeout Report for IHSS Group 300-1 (DOE 2003b).

No Further Action Recommendation

Based on the actions taken, results of soil characterization, and SSRS conducted as part of the accelerated action, NFAA was justified.

DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS Group 300-1 on June 20, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2002, Correspondence to R. Disalvo, DOE, RFFO from S. Gunderson, CDPHE RE: Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-10, October 24.

CDPHE, 2003, Correspondence to R. Disalvo, DOE, RFFO from S. Gunderson, CDPHE RE: Final Closeout Report for IHSS Group 300-1, June 20.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan, Rocky Flats Plant 100 Area, Operable Unit 13, October.

DOE, 1995, Draft Data Summary No. 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003a, Historical Release Report 2003 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Closeout Report for IHSS Group 300-1, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 300-181

IHSS Number: 181
Current Operable Unit: None
Former Operable Unit: 10
IHSS Group: None
Unit Name: Building 334 Cargo Container Area

This Final Update to the HRR for PAC 300-181 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 181 is summarized in this update. The following HRR volumes contain IHSS 181 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

Summer of 1984 to July 1986

Historical Summary

This storage area was located to the north of Building 334 and consisted of one cargo container with an area of 160 ft². The location of IHSS 181 is shown on Figure 16. Although it had the capacity to hold up to eighteen drums, the maximum number of drums ever stored in the container was seven. No berms surrounded the area, but a collection pan was located in the bottom of the cargo container. Wastes stored in the container included machine oils, solvents, machine coolants and possibly low-level radioactive wastes. While in use, the storage container was monitored weekly on the inside and outside. No other documentation was found which detailed the response to this operation. No documentation of spills or leaks was found in relationship to this unit (DOE 1992a).

IHSS Investigations

As part of the OU 10 RFI/RI Work Plan (DOE 1992b), three soil gas samples were collected within IHSS 181 and analyzed for VOCs. One detection of methane gas was identified at 50 ppm. There were no other positive detections (DOE 1995).

No Further Accelerated Action Recommendation

Based upon the OU 10 analytical data and the history of this IHSS having no documented spills, this IHSS was recommended for no further action.

Following regulatory agency review of IHSS 181 information presented in the 1997 Annual Update to the HRR, DOE received approval from CDPHE (the LRA) and EPA of the NFA status for IHSS 181 (CDPHE and EPA 1999).

Comments

Methane gas is commonly found at levels mentioned above (50 ppm) due primarily to decomposing organic matter and interbedded coal seams along the Front Range.

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1991, Phase I RFI/RI Work Plan, Operable Unit 10, Other Outside Closures, Draft Final, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan Other Outside Closures (Operable Unit No. 10), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Technical Memorandum 1, Operable Unit 10, Other Outside Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 300-186

IHSS Number: 186
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Groups: 500-1 and 000-4
Unit Name: Valve Vaults 11, 12, and 13 (IAG Name: Valve Vault 12)

This Final Update to the HRR for PAC 300-186 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 186 is summarized in this update. The following HRR volumes contain IHSS 186 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1985 to 1989

Historical Summary

IHSS 186 consists of soil associated with NPWL Valve Vaults 11, 12, and 13, which were inline vaults along the process waste line that ran south of Building 374 and west of Building 552. The location of IHSS 186 is shown on Figure 16. The vaults were connected by the process waste lines and the containment lines that surround the pipes. Valve Vaults 11, 12, and 13 as well as associated pipeline are part of PAC 000-504, NPWL. In addition to secondary containment, the process waste lines were equipped with leak-detection sensors. Several incidents occurred in one or more of these vaults resulting in the release of process waste to the environment. The total quantity of waste released to the environment is uncertain because leak-detection equipment was not always triggered immediately and therefore it is not known when some of the leaks began. In spite of clean-up activities undertaken in response to these leaks, radiation levels remained above background when cleanup was complete (DOE 1992a).

The first documented incident was on June 12, 1985. Contractors excavating a drainage ditch along the southern side of the PA in the northeastern corner of the Building 371 Parking Lot broke the outer containment of four lines and the inner line of the low-level transfer line near Valve Vault 13. Soon afterward, pumping began from the process waste tanks in Building 460 to Building 374 allowing liquid to be released from the inner pipe. The waste consisted of Oakite (tri sodium phosphate, used for industrial metal cleaning) and distilled water. An estimated 4.4 gallons were spilled on the ground. The pipe was subsequently repaired and investigation at that time revealed no radioactive contamination associated with the break (DOE 1992a).

In June 1986, acidic waste corroded a 1-inch-diameter hole in a black iron flange connected to a stainless steel piping system, causing a release of waste into Valve Vault 13. In October 1986, soil surrounding the area was found to be saturated with a yellow liquid containing americium, plutonium, and uranium. Monitoring of the area indicated the presence of gross alpha, gross

beta, and uranium-238 contamination of up to 1.7×10^5 , 5×10^4 , and 9×10^2 pCi/L, respectively. In response to the incident, the black iron flange was replaced with a stainless steel flange without further release of contamination (DOE 1992a).

The process waste line between Valve Vault 12 and Valve Vault 13 was reported leaking on October 24, 1986. The process waste lines were initially designed to provide a constant slope between adjacent valve vaults to allow any liquid in the containment pipe to flow into a vault and trigger an alarm, but some of the lines were repaired or replaced in 1981 or 1982 in a manner that did not allow gravity drainage. Instead a trap was created, allowing saturation of the bedding material and soil around the pipe, and no alarm sounded when the release occurred. An area 30 by 100 ft was excavated to locate the leak, and repairs were completed on November 13, 1986. A series of small cofferdams was built to contain surface and groundwater, and the collected fluids were removed by a tank truck and placed in SEP Pond 207A. Approximately 24 waste boxes of uranium-contaminated sand and gravel were shipped offsite as low-level radioactive waste. Cleanup was completed on December 8, 1986. Radiation levels were reduced to slightly above background and the area was backfilled (DOE 1992a).

On June 1, 1987, a radioactive leak was discovered near Valve Vault 13 when contamination was found in the culvert drain collection basin. The leak was in the high-level transfer line between Building 374 and Valve Vault 13. Analytical results from samples collected in the culvert drain collection basin indicated 42,000 pCi/L gross alpha activity and 13,000 pCi/L gross beta activity. Direct counts on soil and the culvert were reported as "high." In response to the culvert contamination in 1987, dikes were installed in the drain path to prohibit further draining. Liquids were drained from the transfer pipe and pumped to a mobile tanker. The culvert and associated soil were removed until both alpha and beta counts were less than 250 cpm. The high and low level transfer lines were to have been replaced with fibercast piping and the containment piping repaired to the original design specifications (DOE 1992a).

On September 13, 1988 Valve Vault 12 was flooded with 1,700 gallons of high nitrate solution during transfer between Building 774 and Building 374. A connection at a tygon tube became separated, which allowed the leak to occur (DOE 1992a).

In October 1989, approximately 10,000 gallons of SEP water was found in Valve Vaults 11, 12, and 13. The water exhibited 3,122 to 7,134 pCi/L gross alpha activity. Alarms had sounded in the Building 231 Pump House, Pump Station #1 and Valve Vault 19 but upon inspection no problems were found at these locations. The inspection continued and resulted in the discovery of liquids in Vaults 11, 12, and 13. Pumping from Buildings 778 and 774 was stopped and the appropriate lockout/tagouts were provided on the valves in Valve Vault 12 and in the Building 231 Pump House. The liquid was removed and repairs to the line were completed by October 22, 1989. The line was flow tested successfully. A RCRA CIPR (89-015) was prepared and submitted (DOE 1992a).

IHSS Investigations

IHSS 186 was investigated in accordance with the OU13 RFI/RI Work Plan (DOE 1992b). Eleven surface soil samples and 69 soil gas samples were collected. Soil gas samples were analyzed for VOCs. Based on the history of this IHSS, the surface soil samples were analyzed only for radionuclides. VOCs in soil gas exceeded 1 $\mu\text{g/L}$ at 10 percent of the locations sampled. Chlorinated solvents and benzene were the compounds detected. All results for surface soil

samples were less than PPRGs, but plutonium-239/240 activities were greater than the background mean plus two standard deviations in all of the samples and americium-241 activities were greater than the background mean plus two standard deviations in all but one of the samples (DOE 1995).

Accelerated Action Activities

RFCA (DOE et al. 1996) accelerated action activities were conducted at IHSS 186 under IHSS Groups 500-1 and 000-4 (NPWL). IHSS Group 500-1 accelerated action activities were conducted at IHSS 186 in accordance with IASAP Addendum #IA-04-03 (DOE 2003b). Accelerated action soil characterization sampling at IHSS 186 included 26 statistical and 11 biased sampling locations. All accelerated action characterization sampling results for samples located within IHSS 186 were less than the applicable RFCA WRW soil ALs (DOE et al. 2003). Based on the results of accelerated action and historical sampling, no remediation was required.

RFCA (DOE et al. 1996) accelerated action activities were conducted in IHSS 186 in accordance with ER RSOP Notification #05-01 (DOE 2004a) for IHSS Group 000-4 (NPWL). Characterization samples collected in accordance with IASAP Addendum # IA-04-03 (DOE 2003b) were collected at 13 locations associated with Valve Vaults 11, 12, and 13, and associated piping. Samples were collected at depths targeted for the depth of the NPWL at each location. Sampling data for eleven characterization sampling locations sampled under the IHSS Group 500-1 sampling program were also considered as NPWL characterization samples. Analytes included radionuclides, metals, VOCs, and SVOCs, but varied with location. All results were less than RFCA WRW soil ALs (DOE et al. 2003), except for radionuclides in subsurface soil sampled at sampling location BX44-001, along the NPWL between Valve Vaults 12 and 13. The plutonium-239/240 activity was 3229 pCi/g and the activities of americium-241, uranium-234, uranium-235, and uranium-238 were also well above their RFCA WRW soil ALs (DOE 2005a).

Remedial action was conducted in accordance with ER RSOP Notification #05-01 (DOE 2004a). Soil was removed at the BX44-001 hot spot between Valve Vaults 12 and 13. Seven confirmation samples were collected in the excavation, five of which were analyzed for radionuclides and VOCs, and the remaining two were analyzed for radionuclides and metals. All confirmation sampling results were less than RFCA WRW soil ALs. In addition to the complete removal of Valve Vaults 11, 12, and 13, remedial activities in IHSS 186 included the removal of process waste lines between Valve Vaults 10 and 11, Valve Vaults 11 and 12, between Valve Vaults 12 and 13, north of Valve Vault 13, and connecting Valve Vault 12 to Building 231 and Tanks 231A and 231B. The process waste line west of Valve Vault 13 that connects to Valve Vault 14 was RCRA clean closed and left in place, with a residual rinse of 74.3 pCi/L for gross alpha/gross beta (DOE 2005a).

No Further Accelerated Action Recommendation

NFA was recommended for IHSS 186 based on the following:

- All residual contaminant concentrations in surface and subsurface soil were less than RFCA WRW soil ALs (DOE 2004b).
- NFAA is justified based on the SSRS (DOE et al. 2003) (DOE 2004b).

After review of the IHSS Group 500-1 Data Summary Report (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS Group 500-1, including IHSS 186, on September 29, 2004 (CDPHE 2004). NPWL removal and dispositioning was completed as of July 2005. These activities are documented as part of the IHSS Group 000-4 Closeout Report (DOE 2005a) and the RCRA Closure Description Document (DOE 2005b).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 500-1, IHSS 300-186, IHSS 500-117.1 and IHSS 500-197, dated September 2004, September 29.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Final Phase I RFI/RI Work Plan, Rocky Flats Plant 100 Area, Operable Unit 13, October.

DOE, 1995, Data Summary 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2003b, Industrial Area Sampling and Analysis Plan Addendum #IA-04-03, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004a, ER RSOP Notification #05-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004b, Draft Data Summary Report for IHSS Group 500-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for IHSS Group 000-4, New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, RCRA Closure Description Document, Rocky Flats Environmental Technology Site, Golden Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 300-188

IHSS Number: 188
Current Operable Unit: IA
Former Operable Unit: 8
IHSS Group: None
Unit Name: Acid Leak

This Final Update to the HRR for PAC 300-188 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 188 is summarized in this update. The following HRR volumes contain IHSS 188 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1983

Historical Summary

IHSS 188 is an unpaved area near the east gate of Building 374 where acid leaked from a drum in 1983. This location of IHSS 188 is shown on Figure 16. The drum contained up to 55 gallons of a mixture of nitric acid and hydrochloric acid, probably a waste metal-leaching solution originating in the 400 Area. The solution may have contained heavy metals (DOE 1992). No documentation was found detailing a response to this occurrence.

IHSS Investigations

Surface soil was sampled at five locations within IHSS 188 in accordance with the OU 8 RFI/RI Work Plan (DOE 1994). The samples were analyzed for metals. There were no detections greater than background concentrations with the exception of cobalt at a slightly elevated level (DOE 1995).

No Further Accelerated Action Recommendation

Based on the OU 8 soil sampling results, the relatively small amount of acid spilled, and the neutralization effect over time, it was concluded that no threat of adverse health effects existed under the exposure conditions evaluated (DOE 1997). NFA was recommended for IHSS 188, consistent with the criteria for recommending NFA decisions presented in RFCA Attachment 6 (DOE et al. 1996).

After a review of IHSS 188 information presented in the 1997 Annual Update to the HRR by regulatory agencies, DOE received approval from CDPHE (the LRA) and EPA of the NFAA status for IHSS 188 (CDPHE and EPA 1999).

Comments

IHSS 188 includes PIC 44.

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Phase I RFI/RI Work Plan, Operable Unit 8, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Data Summary Report 2 Operable Unit 8 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 300-206

IHSS Number: 206
Current Operable Unit: IA
Former Operable Unit: 10
IHSS Group: 300-5
Unit Name: Inactive Hazardous Waste Tank D-836

This Final Update to the HRR for PAC 300-206 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 206 is summarized in this update. The following HRR volumes contain IHSS 206 information:

Original Report – 1992 (DOE 1992a);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1975 to late 1980s

Historical Summary

The location of IHSS 206 (former Tank D-836) is shown on Figure 16 along the northern side of Building 374. Tank D-836 was a 19,000-gallon, carbon steel tank used for hazardous waste storage. The tank had no secondary containment and was located on compacted soil. It was identified as a portion of Unit #42 in the RCRA Part B Permit Application, specifically Unit #42.14 (DOE 1992b). The tank held off-specification product water, which was defined as having conductivity exceeding 150 micromhos per centimeter ($\mu\text{mhos/cm}$) (DOE 1992a).

A spill of condensate water occurred on February 18, 1980 when a line from the evaporator to the tank was disconnected. The spill in 1980 was found to contain low concentrations of tritium (DOE 2000). The tank was a 90-day accumulation area and was reported removed from IHSS 206 in 1987. Other information indicates that the tank was in operation outside of Building 374 prior to 1990. Photographs taken in 1992 as part of the OU 10 RFI/RI Work Plan (DOE 1992c) confirmed that the tank was removed.

IHSS Investigations

Based on historical information, regarding the 1980 release, sampling was conducted for tritium and total metals in 1994, in accordance with the OU 10 Work Plan (DOE 1992c). Ten surface soil samples and one duplicate were collected from the IHSS. Only two metals were detected at concentrations greater than background. Copper had a maximum concentration of 35.9 mg/kg and zinc had a maximum concentration of 258 mg/kg. All results were below RFCA Tier II soil ALs (DOE 1995, DOE et al. 1996).

No Further Accelerated Action Recommendation

Based on the results of the OU 10 soil sampling, no contaminant source was indicated in IHSS 206. Therefore IHSS 206 was proposed for no further action consistent with the RFCA Attachment 6 criteria (DOE et al. 1996) for no further action decisions (DOE 2001).

After a review of IHSS 206 information presented in the HRR 2001 Annual Update (DOE 2001) by regulatory agencies, DOE received approval from CDPHE (the LRA) and EPA of the NFAA status for IHSS 206 (CDPHE and EPA 2002).

Comments

Ten of 11 antimony results were rejected because predigestion matrix spike (MS) criteria were not met at the laboratory; however, the one acceptable result of 3.2 mg/kg was well below background levels (DOE 1995).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, RCRA Part B Permit Application Unit #42, (Unit #42.14), Rocky Flats Plant, Golden, Colorado.

DOE, 1992c, Final Phase 1 RFI/RI Work Plan, Outside Closure (Operable Unit 10), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Draft Technical Memorandum 1, Operable Unit 10 (Other Outside Closures), Rocky Flats Plant, Golden, Colorado, January.

DOE, 2000, Reconnaissance-Level Characterization Report (RLCR) Building 371 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 300-212

IHSS Number: 212
Current Operable Unit: 15
Former Operable Unit: 15
IHSS Group: Not Applicable
Unit Name: Building 371 Drum Storage, Unit 63

This Final Update to the HRR for PAC 300-212 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 212 is summarized in this update. The following HRR volumes contain IHSS 212 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1980 to 1997

Historical Summary

Unit 63 was located in Room 3420 of Building 371 and was used to store transuranic (TRU) mixed solid waste. This location of IHSS 212 is shown on Figure 16. The storage capacity was 950 55-gallon drums or 259 cy of solid waste. However, because of the Settlement and Compliance Order of July 1, 1989, the maximum allowed number of drums was 668. No processing was conducted in Room 3420. Drums were brought to Building 371 from various sources at the Plant and stored in Room 3420 prior to shipment to an off-site disposal facility (DOE 1992).

Interviews with operations personnel indicated no releases occurred from any drum stored in Room 3420, and no documentation was found detailing any releases associated with Room 3420. Walls, floors, and berms in the room were constructed of concrete with an epoxy finish and drums were placed on pallets to keep them off the floor and allow for inspection. Waste constituents included TRU waste, carbon tetrachloride, 1,1,1-trichloroethane, and toluene. The Interim Status Closure Plan provides a complete list of hazardous constituents (DOE 1992).

Under a modification of the RCRA permit, Unit 63 was incorporated into Unit 371.1 and was closed as part of that unit (Personal Communication, C. Hicks, May 10, 2005; DOE 1995).

IHSS Investigations

Because there were no spills at this IHSS, no investigations were necessary.

No Further Accelerated Action Recommendation

No further accelerated action was recommended for IHSS 212 because there was no history of spills in the IHSS.

After a review of IHSS 212 information presented in the 1997 HRR (DOE 1997) by the regulatory agencies, DOE received approval from CDPHE (the LRA) and EPA of the NFAA status for IHSS 212 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

C. Hicks, personnel communication May 10, 2005.

PAC REFERENCE NUMBER: 300-700

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Scrap Roofing Disposal

This Final Update to the HRR for PAC 300-700 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-700 is summarized in this update. The following HRR volumes contain PAC 300-700 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1955 to 1981

Historical Summary

During construction of the PSZ (later referred to as the PA) in March 1981, an old burial trench (PAC 300-700) was discovered approximately 500 ft west of Building 371, as shown on Figure 16. The garage foreman in 1981 recalled seeing trash and other building material in an excavation as early as 1955 and also remembers covering the hole in 1968 after roofing material was added from 1965 through 1968. A 1975 document states that valves, pipefittings, tire chains, and other subcontractor material were buried “north of 331” and “north of the firebarn” (DOE 1992).

Material uncovered in 1981 was primarily roofing material, styrofoam, asphalt, and plastic sheeting. The source of the roofing material is not known. One report cites dumping from 1965 to 1968 with the material originating from Buildings 776 and 883. Another source states that it originated from Building 881 or 444 and was disposed of in the early 1970s (DOE 1992).

During the 1981 trench excavation and cleanup activities, the material was monitored with no detection of radioactivity on the material or in the trench. The scrap was moved to the Present Landfill (DOE 1992). Additional building material was uncovered during borrow soil excavation in 2005 and the material was removed as sanitary waste. The area of soil removal is shown on Figure 17.

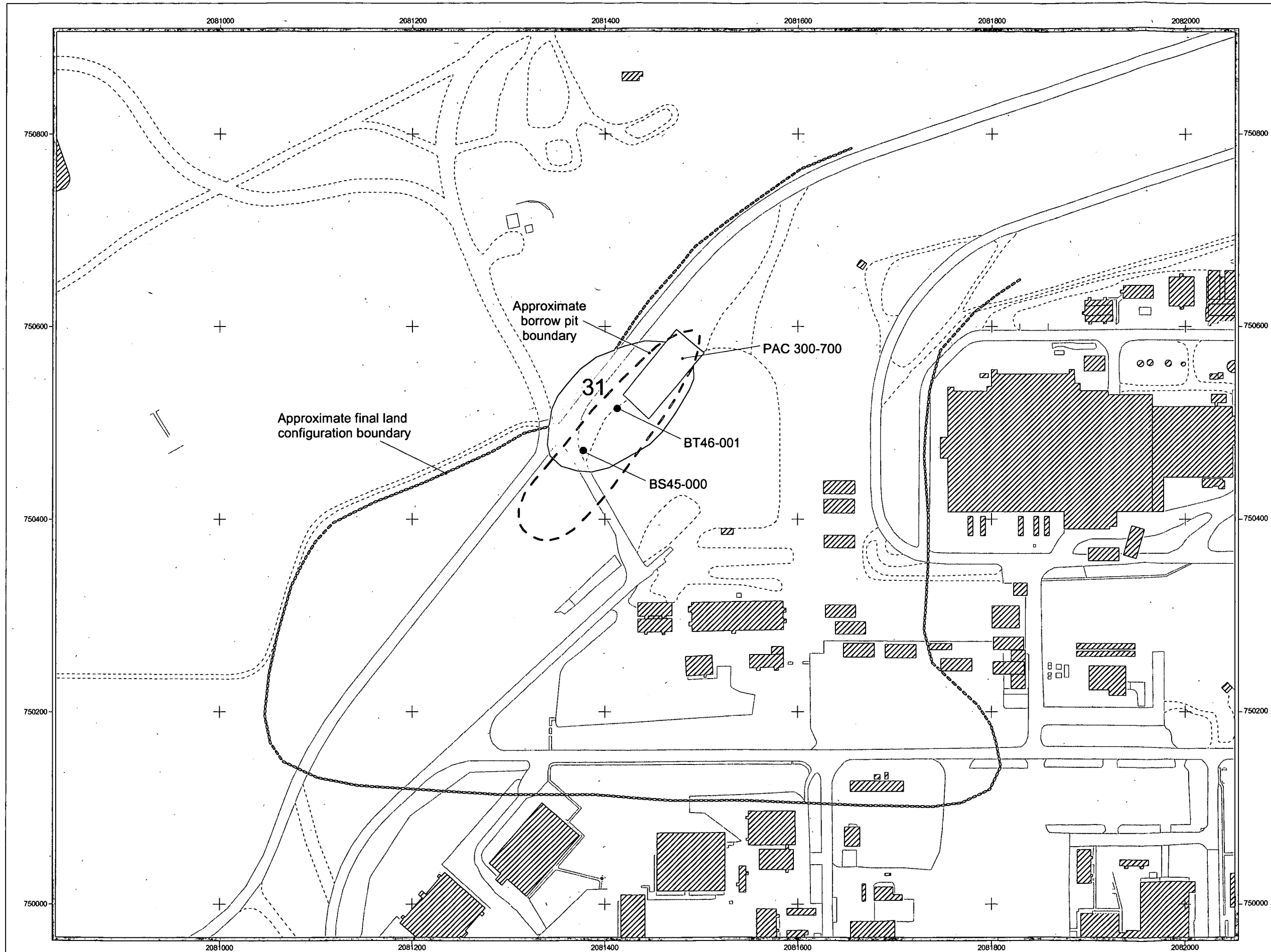
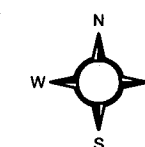


Figure 17
PAC 300-700

KEY

- Sample location
- - - Approximate borrow pit boundary
- - - Approximate final land configuration boundary
- Paved road
- - - Dirt road
- Buffer Zone Site
- Standing building
- ▨ Demolished building



0 100 200 Feet

Scale = 1: 2,400

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 09.29.05



PAC Investigations

Based on observations and monitoring during trench excavation, material in the trench did not appear to be hazardous. No further investigations were conducted.

No Further Action Recommendation

Based on the results of monitoring performed during cleanup of the trench, no hazardous materials were observed. PAC 300-700 was recommended for NFA consistent with the criteria presented in RFCA Attachment 6 (DOE et al. 1996).

After a review of PAC 300-700 information presented in the Original 1992 HRR by regulatory agencies, DOE received approval from CDPHE (the LRA) and EPA of the NFA status for PAC 300-700 (EPA 1992; CDPHE and EPA 2002).

Comments

PAC 300-700 is the same as BZ Contamination Report Site 31 (Figure 17).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-701

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Sulfuric Acid Spill, Building 371

This Final Update to the HRR for PAC 300-701 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-701 is summarized in this update. The following HRR volumes contain PAC 300-701 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

December 20, 1989

Historical Summary

PAC 300-701 is located at the east-facing loading dock near the southeast corner of Building 374 (Figure 16). On December 20, 1989, a 55-gallon drum containing 20 gallons of sulfuric acid solution was found ruptured on Dock 9T on the east side of Buildings 371/374. Approximately 19 of the 20 gallons of solution were spilled. The rupture was attributed to freezing and thawing of the contents during collection and transportation from the generation point to the 90-day accumulation point located at Dock 9T. The solution in the drum was a composite of eight different containers expected to have pHs between 2 and 8 prior to being emptied into the drum. Analytical results of the liquid in the drum indicated a pH of 1.36. Approximately one-half of the spilled solution flowed through Door 8 onto Dock 8 where it was contained in the sloped bermed area (DOE 1992).

The solution was removed from the floor with a wet vacuum, the floor was washed and the wash water was also removed with the wet vacuum. After removal from the vacuum, the mixture was sent to the process waste system through the process sump collection Tank D-85 via the Building 374 floor drain system. The one gallon of acid remaining in the ruptured drum was transferred to another container and then processed (DOE 1992).

RCRA CPIR No. 89-023 was submitted in accordance with 6 CCR 1007-3, Part 265.56(j).

PAC Investigations

No environmental investigation was required because the spill did not result in a release to the environment.

No Further Accelerated Action Recommendation

Because the spilled solution was contained on Dock 9T and the adjacent Dock 8, there was no release to the environment. No further accelerated action was recommended, consistent with the criteria presented in RFCA Attachment 6 (DOE et al. 1996).

After a review of PAC 300-701 information presented in the original 1992 HRR by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-701 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14. DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-702

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 300-6
Unit Name: Pesticide Shed

This Final Update to the HRR for PAC 300-702 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-702 is summarized in this update. The following HRR volumes contain PAC 300-702 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1952 to 1988

Historical Summary

Building 367 was used to store pesticides and herbicides beginning in 1952, when the first spill is assumed to have occurred. The location of PAC 300-702 is shown on Figure 16. Equipment and pesticide containers were cleaned at this location and the rinsate water was dumped onto the ground outside the building. There were no spill containment features; therefore, release of contamination to a nearby drainage ditch was possible. In 1988, large quantities of pesticides and herbicides were being stored in the buildings, which showed signs of spills and leaks. In 1988, the unused chemicals were disposed of in an unknown location and the area around the building was cleaned up (DOE 1992).

PAC Investigations

RFCA (DOE et al. 1996) accelerated action activities were conducted at PAC 300-702 as part of IHSS Group 300-6 in accordance with BZSAP Addendum #BZ-02-01 (DOE 2002). Accelerated action soil characterization included surface soil sampling at five locations. One location was in approximately the center of the former pesticide shed, one was at the eastern edge of the former building, and the other three were within 10 ft of the pesticide shed location on the northern, southern, and western sides. The samples were analyzed for organochlorine pesticides, organophosphorus compounds, and chlorinated herbicides. All results were below applicable WRW soil ALs (DOE et al. 2003). Based on the results of accelerated action sampling, no remediation was required at PAC 300-702 (DOE 2003b).

No Further Accelerated Action Recommendation

Based on the IHSS Group 300-6 analytical data (DOE 2003b), there was no soil contamination present in PAC 300-702, and the SSRS (DOE et al. 2003) indicated no further accelerated action was required. Therefore, the site was recommended for NFAA.

DOE received CDPHE (the LRA) approval of the NFAA status for PAC 300-702 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson, CDPHE; RE: Final Closeout Report for IHSS Group 300-6, July 21.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Characterization Data Summary Report for IHSS Group 300-6, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 300-703

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 331 North Area

This Final Update to the HRR for PAC 300-703 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-703 is summarized in this update. The following HRR volumes contain PAC 300-703 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 7, 1970

Historical Summary

PAC 300-703 is located north of Building 331, as shown on Figure 16. The PAC 300-703 area overlaps with PAC 300-134S.

On October 7, 1970, preheated road oil vapors in a tar trailer ignited when they came in contact with the hot burners that had just been turned off. Vapors were directed against hot burners when the tar trailer lid was closed to transport preheated oil to the job site. The hot oil was to be used on roads. As a result of the fire, oil vapors and the residual of burned road oil was released to the air. The fire was extinguished by the Fire Department with water and dry chemical (DOE 1992).

PAC Investigations

The incident did not involve a release to soil, surface water, or groundwater. Therefore, no investigation was deemed necessary.

No Further Accelerated Action Recommendation

There is no record of a release to soil, surface water, or groundwater at PAC 300-703. No further accelerated action was recommended consistent with the RFCA Attachment 6 criteria for no further action decisions presented in RFCA (DOE et al. 1996).

After a review of PAC 300-703 information presented in the original 1992 HRR by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-703 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Environmental Technology Site, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-704

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Roof Fire, Building 381

This Final Update to the HRR for PAC 300-704 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-704 is summarized in this update. The following HRR volumes contain PAC 300-704 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 1982

Historical Summary

A small fire occurred on the roof of Building 381 involving venting of a leaking cylinder of fluorine. The location of PAC 300-704 is shown on Figure 16. The fluorine gas reacted with the iron vent pipe causing ignition and the release of smoke and vapor. No documentation was found that detailed response to the occurrence. The lack of documentation suggests that damage to the building was minimal (DOE 1992).

PAC Investigations

The incident did not involve a release to soil, surface water, or groundwater. Therefore, no investigations were deemed necessary.

No Further Accelerated Action Recommendation

There was no indication of a release to soil or water in connection with the fire. No further accelerated action was recommended consistent with the RFCA Attachment 6 criteria for NFA decisions (DOE et al. 1996).

After a review of PAC 300-704 information presented in the original 1992 HRR by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-704 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-705

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Potassium Hydroxide Spill North of Building 374

This Final Update to the HRR for PAC 300-705 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-705 is summarized in this update. The following HRR volumes contain PAC 300-705 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

May 1989

Historical Summary

As shown on Figure 16, PAC 300-705 is located on the north side of Building 374, where there was a potassium hydroxide storage tank.

In May 1989, a small spill of potassium hydroxide occurred at the storage tank. A small amount of the caustic mixed with rainwater in the containment berm. After the spill was discovered, the liquid was pumped back into the process waste stream and a leaking flange was repaired (DOE 1992).

PAC Investigations

Investigation was not deemed necessary because only a minimal amount of caustic was released to the environment, and it is expected that dilution with rainwater and chemical interactions with soil neutralized the pH, thus eliminating the hazardous characteristic of the substance.

No Further Accelerated Action Recommendation

Because of the small quantity released and the prompt cleanup effort, there was no significant release to the environment. This PAC was therefore recommended for NFA consistent with RFCA Attachment 6 (DOE et al. 1996).

After a regulatory agency review of PAC 300-705 information presented in the original 1992 HRR, DOE received approval from EPA and CDPHE of the NFAA status for IHSS 300-705 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-706

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Evaporator Tanks North of Building 374

This Final Update to the HRR for PAC 300-706 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-706 is summarized in this update. The following HRR volumes contain PAC 300-706 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

May 24 or May 26, 1989

Historical Summary

Figure 16 shows the location of PAC 300-706, where an evaporator tank leaked. A subsequent leak occurred in this same general location in 1994 (see PAC 300-714).

While performing a pressure test of Tank 805, a leak occurred from a defective gasket. Tank 805 was the fourth vapor body on the evaporator system that concentrated low-level mixed waste. It was located north of Building 374 and had a 20,000-gallon capacity. The liquid spilled onto the plywood decking, leaked through the decking, and dripped onto the concrete slab located approximately 22 ft below on the ground. The concrete pad sloped toward a sump embedded in sand in which the liquid was contained. The spill consisted of approximately 2 gallons that had mixed with roughly 60 gallons of rainwater. The waste stream, which originated from various buildings, typically involved a variety of chemicals and dissolved salts. The waste was typically slightly basic and had a specific gravity of 1.3. Analytical results of samples collected from the sump pit contained 25 to 50 mg/L nitrate, 0.1 mg/L total chromium, more than 10.02 mg/L silver, 2 to 32 pCi/L gross alpha activity, and 1.03 pCi/L gross beta activity (DOE 1992).

Pressure was relieved on the tank and the test was discontinued. Smear samples collected around the area did not indicate any contamination. The plywood was cleaned with soap, wipes, and cotton towels. The concrete was washed with soap and water with all liquid contained in the sump. The liquid was pumped to Tank D-852 via the main process waste system. The saturated sand and all cleaning materials were bagged and treated as low-level mixed waste. The gasket was repaired and the tank was placed back in service (DOE 1992).

RCRA CIPR No. 89-005 was submitted in accordance with 6 CCR 1007-3, Part 265.56(j).

PAC Investigations

No investigation was deemed necessary because the spill was completely contained and cleaned up. There was no release to the environment.

No Further Accelerated Action Recommendation

The spill was completely contained and the spilled liquid and washwater associated with the cleanup were returned to the Building 374 waste treatment system. Solids associated with cleanup were bagged and managed as low-level waste. PAC 300-706 was recommended for NFA based on the RFCA Attachment 6 criteria for NFA decisions (DOE et al. 1996).

After a regulatory agency review of PAC 300-706 information presented in the 1992 HRR, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-706 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-707

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Sanitizer Spill

This Final Update to the HRR for PAC 300-707 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-707 is summarized in this update. The following HRR volumes contain PAC 300-707 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 31, 1985

Historical Summary

A tank on a truck owned by an off-site vendor leaked sanitizer on the shoulder of the road at Sixth Street and Sage Avenue. Figure 16 shows the location of PAC 300-707. Approximately 3 gallons of sanitizer were spilled. The sanitizer consisted of a water and formaldehyde mixture. The truck's tank was drained into buckets. The truck subsequently left the site and was ordered to have the tank fixed before returning to the Plant (DOE 1992).

According to the Agency for Toxic Substances and Disease Registry (ATSDR) online toxicological profile for formaldehyde, formaldehyde in water degrades to low levels in a few days when released to the environment (www.atsdr.cdc.gov/toxprofiles/).

PAC Investigations

No investigation was required because the sanitizer solution was dilute and the quantity spilled was small, resulting in no threat to the environment.

No Further Accelerated Action Recommendation

PAC 300-707 was recommended for NFA consistent with the RFCA Attachment 6 criteria for NFA decisions (DOE et al. 1996).

After a regulatory agency review of PAC 300-707 information presented in the 1992 HRR, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-707 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-708

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformers North of Building 371

This Final Update to the HRR for PAC 300-708 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-708 is summarized in this update. The following HRR volumes contain PAC 300-708 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to August 1991

Historical Summary

PAC 300-708 is located at the northwestern corner of Building 371, as shown on Figure 16. Six transformers were located north of Building 371 within a rock-filled berm: 371-1, 371-2, 371-3, 371-4, 371-5, and 371-6. Transformers 371-7 and 371-8, located in Room 3581 of Building 371, were also included in this PAC for purposes of providing information, not to imply that they leaked. It was noted in one reference that the area outside Room 3581 had the potential to be contaminated with PCBs because of a transformer spill or fire. At Transformer 371-1, staining was observed on the pad beneath the drain valve, indicating leaks (DOE 1992).

In the 1980s, Rocky Flats initiated a program to comply with EPA regulations controlling electrical transformers that contained PCBs. The RFP Environmental Hazard Elimination Program included transformer fluid replacement. The program was finalized in 1986 (DOE 1992). The following table presents 1985 and 1992 total PCB results for the oil in the transformers before and after replacement (DOE 1996):

Transformer No.	1985 Results	1992 Results
371-1	2,244 ppm	20 ppm
371-2	20 ppm	19 ppm
371-3	58 ppm	4 ppm
371-4	1,799 ppm	18 ppm
371-5	952 ppm	12 ppm
371-6	1,026 ppm	13 ppm

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, surface soil samples were collected at PAC 300-708 and analyzed in accordance with approved EPA protocols (DOE 1995). In 1995, under the approved Final PAM for Remediation of PCBs (DOE 1995), approximately 300 screening samples were collected to determine the presence (or absence) of PCB contamination in the soil and determine the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080 (DOE 1996). Based on the results, approximately 1.08 cy of soil were excavated on the northern side of Transformer 371-2, containerized, and shipped offsite for disposal (DOE 1997). Confirmation sampling indicated residual PCB concentrations in soil were less than 10 ppm (DOE 1997).

Recently there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW AL of 12.4 ppm, adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper supports the following conclusions:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

No Further Accelerated Action Recommendation

Based on the confirmation sampling results, PCB concentrations in the soil were detected at less than 10 ppm in soil. PCB results for the concrete samples were less than 1.3 ppm. Based on the site data and White Paper findings noted above, NFA was recommended for PAC 300-708 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c).

After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 300-708 on May 6, 2004 (CDPHE 2004).

Comments

The boundaries of this PAC location were originally estimated. The boundaries were revised for the 2004 Annual Update to the HRR (DOE 2004) based on sampling location surveys and field reconnaissance.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification for PCB Potential Areas of Concern (dated April 15, 2004), May 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for the Source Removal of PCBs, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, White Paper, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

PAC REFERENCE NUMBER: 300-709

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Leak - 334-1

This Final Update to the HRR for PAC 300-709 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-709 is summarized in this update. The following HRR volumes contain PAC 300-709 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1975 to 1986

Historical Summary

Figure 16 shows the location of PAC 300-709, a transformer leak. Transformer 334-1 was located on a concrete pad and surrounded by a concrete berm adjacent to the northwest side of Building 334. Plant utility records indicate the transformer had been used previously at several other locations. This 500 KVA transformer was manufactured in 1975 and contained 285 gallons of dielectric fluid. Prior to being flushed and retrofilled in 1986 as part of the Sitewide Environmental Hazard Elimination Program, the transformer contained mineral oil with 772 ppm PCBs (DOE 1992).

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected at this location in accordance with approved EPA sampling protocols, and analyzed for PCBs using EPA Method 8080 (DOE 1995). All 1991 analytical results for PCBs were below 0.2 ppm (DOE 1996).

Recently there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW AL of 12.4 ppm, adequately protects human

health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper supports the following conclusions:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

No Further Accelerated Action Recommendation

Based on the site data and White Paper findings noted above, NFA was recommended for this PCB site in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c).

After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 300-709 on May 6, 2004 (CDPHE 2004).

Comment

The boundaries of this PAC location were originally estimated. The boundaries were revised for the 2004 Annual Update to the HRR (DOE 2004a) based on sampling location surveys and field reconnaissance.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification for PCB Potential Areas of Concern (dated April 15, 2004), Rocky Flats Environmental Technology Site, Golden, Colorado, May 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, White Paper, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

PAC REFERENCE NUMBER: 300-710

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Gasoline Spill North of Building 331

This Final Update to the HRR for PAC 300-710 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-710 is summarized in this update. The following HRR volumes contain PAC 300-710 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 30, 1991

Historical Summary

As shown on Figure 16, PAC 300-710 is located immediately north of Building 331. On August 30, 1991, approximately 2 gallons of unleaded gasoline spilled from the vent on a contractor's supply truck. The spill occurred on a paved surface and was immediately contained. The resulting waste, approximately 5 ft³, was packaged and transported to the Building 331 90-day accumulation area. It was managed as a RCRA-regulated hazardous waste because of its benzene content. This material was disposed of in accordance with the Site's waste disposal program. RCRA CPIR Report No. 91-018 was submitted to CDH in response to the incident (DOE 1992).

PAC Investigations

No investigations were required because the spill was on a paved surface.

No Further Accelerated Action Recommendation

No further action was recommended for this PAC because the spill occurred on a manmade surface and was contained and cleaned up. There was no release to soil. The recommendation for NFA was consistent with the criteria for recommending NFA decisions presented in RFCA Attachment 6 (DOE et al. 1996).

After a review of PAC 300-710 information presented in the Original 1992 HRR by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-710 (EPA 1992; CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFFO, from M. Hestmark, EPA Region VIII, RE: Potential Area of Concern Needing Further Investigation, Rocky Flats Plant, Golden, Colorado, December 23.

PAC REFERENCE NUMBER: 300-711

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Ni-Cad Battery Spill Outside of Building 373

This Final Update to the HRR for PAC 300-711 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-711 is summarized in this update. The following HRR volumes contain PAC 300-711 information:

Original Report – First Quarterly (DOE 1993);
Update Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

January 30, 1992

Historical Summary

On January 29, 1992, maintenance personnel placed 20 used Ni-Cad rechargeable batteries in two wood boxes on a pallet outside of Building 373. During routine surveillance of the boxes on January 30, 1992, it was noted that one corner of the box and surrounding ground were wet because of a release of less than 1 quart of potassium hydroxide solution from the used batteries. The location of PAC 300-7111 is shown on Figure 16. The solution contained cadmium, nickel, and lithium. The measured pH range was 10 to 14. The solution likely contained cadmium in excess of the TCLP limit of 1 mg/L (DOE 1994).

The HAZMAT team responded to the release and identified low fluid levels in two of the batteries. One-third of the pallet, two wood boxes, and approximately 2 ft of contaminated soil were collected in plastic bags and placed in drums, which were moved to a 90-day accumulation area. All of the batteries were triple-wrapped in plastic and put on a new pallet, which was also placed in a 90-day accumulation area. The material was ultimately disposed of in accordance with the Site's waste disposal program.

A RCRA CPIR (92-002) was submitted to CDH in response to the incident (DOE 1994).

PAC Investigations

No further investigation was required because the contaminated materials were removed.

No Further Accelerated Action Recommendation

No further action was recommended based on the removal of the contaminated materials and implementation of the RCRA Contingency Plan.

After a review of PAC 300-711 information presented in the HRR Seventh Quarterly Update (DOE 1994) by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-711 (CDPHE and EPA 2002).

Comments

This release was listed in the First Quarterly Update to the HRR; however, no formal write-up was made at that time.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1993, Historical Release Report First Quarterly Update 1992, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1994, Historical Release Report Seventh Quarterly Update – January 1, 1994, to March 31, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 300-712

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Antifreeze Spill North of Building 373

This Final Update to the HRR for PAC 300-712 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 300-712 is summarized in this update. The following HRR volumes contain PAC 300-712 information:

Original Report – Seventh Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 25, 1992

Historical Summary

PAC 300-712 is an antifreeze spill area immediately north of Building 373 (Figure 16). One-half gallon of antifreeze was spilled on the pavement at this location by a street sweeper. The antifreeze consisted of approximately 50 percent ethylene glycol and 50 percent water (DOE 1994).

The RCRA Contingency Plan was implemented and the spill was absorbed by absorbent material and packaged. A hazardous waste characterization was made that indicated the material did not need to be managed as RCRA hazardous waste (DOE 1994).

RCRA CPIR No. 91-031 was submitted to CDH in response to the incident.

PAC Investigations

Due to the nature of the spill and the prompt cleanup, no investigations were required.

No Further Accelerated Action Recommendation

No further action was recommended for this PAC because the spill occurred on a manmade surface and was contained and cleaned up. There was no release to soil.

After a review of PAC 300-712 information presented in the HRR Seventh Quarterly Update (DOE 1994) by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-712 (CDPHE and EPA 2002).

Comments

The RCRA CPIR was cross-referenced as being included in the 1992 HRR (DOE 1992); however, upon further examination, it was determined that this spill had not actually been discussed in the original HRR. Thus, it was included in the Seventh Quarterly Update.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, Historical Release Report Seventh Quarterly Update – January 1, 1994, to March 31, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 300-713

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Caustic Spill North of Building 331

This Final Update to the HRR for PAC 300-713 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-713 is summarized in this update. The following HRR volumes contain PAC 300-713 information:

Original Report – Eighth Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

May 17, 1994

Historical Summary

The location of PAC 300-713, a caustic spill site, is shown on Figure 16. At approximately 3:45 P.M. on May 17, 1994, 1 to 2 cups of a corrosive liquid leaked from a trash compactor truck onto pavement north of Building 331. The spill was identified when a green liquid was observed leaking from the parked truck onto the asphalt outside of the Garage (DOE 1994).

The green liquid was identified by its color and smell as Mariko[®], a caustic detergent that was classified at the scene as being a corrosive hazardous waste (D002) because of a pH greater than 12.5. The quantity of material spilled was 1 to 2 cups. A bucket was placed under the truck to capture the remaining liquid leaking from the truck, estimated at 3 to 4 cups. Because it was first reported that 1 quart had been released, the RCRA Contingency Plan was implemented as required for releases greater than 1 pint/1 pound of Mariko[®]. The route taken by the truck from the dumpster that originally contained the Mariko[®] to the spill site was inspected; however, no area other than the garage parking area appeared to have been affected by the release. Oil-Dri[®] was used to absorb the Mariko[®] from the pavement. The used Oil-Dri[®] was placed into a drum pending disposal as nonhazardous waste because the Mariko[®] no longer exhibited the characteristic of corrosivity when absorbed by the Oil-Dri[®]. The remaining Mariko[®] collected in the bucket was used as product, and was not considered a waste (DOE 1994).

On Wednesday, May 18, 1994, the trash compactor truck was taken to the landfill and the trash was emptied onto plastic sheeting while waste technicians searched for the leaking container. The empty container was recovered and identified as a 5-gallon bucket of Mariko[®]. It was later determined that this 5-gallon bucket had been used at Tent 1 for cleaning several months earlier. The bucket had approximately 4 to 6 cups of solution remaining in it when it had been transferred to a storage cargo near Building 554. The bucket was stored in a plastic bag inside the storage cargo. During the winter, the Mariko[®] had built up residue on the bag and had been set outside the cargo on a pallet so that the bag and container could be cleaned up. The Mariko[®]

was still considered to be product rather than waste at that time. It was not determined how the container was placed in the trash. The dumpster in the area of Building 554 was replaced with a locking dumpster with the responsible shift foreman controlling the key (DOE 1994).

RCRA CPIR No. 94-006 was submitted to CDPHE in response to the incident.

PAC Investigations

Because of prompt cleanup of the spill, no investigation was required.

No Further Accelerated Action Recommendation

No further action was recommended for this incident based on the small quantity of Mariko[®] released onto pavement and its recovery by absorption with Oil-Dri[®]. There was no release to soil.

After a review of PAC 300-713 information presented in the Eighth Quarterly Update to the HRR (DOE 1994) by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-713 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, Historical Release Report Eighth Quarterly Update – April 1, 1994, to June 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 300-714

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Laundry Wastewater Spill from Tank T-803, North of Building 374

This Final Update to the HRR for PAC 300-714 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-714 is summarized in this update. The following HRR volumes contain PAC 300-714 information:

Original Report – Tenth Quarterly (DOE 1995); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

November 17, 1994

Historical Summary

PAC 300-714 is a laundry tank spill area located north of Building 374. As indicated on Figure 16, PAC 300-714 overlaps a previous evaporator tank spill area identified as PAC 300-706.

The incident occurred on November 17, 1994, while performing restart operations of the Building 374 evaporator system. The evaporator system had been shut down to perform maintenance on another tank connected in-series (acid tank D-845). A release of a hazardous waste was reported from Tank T-803 when the level controller failed, allowing liquids to accumulate until the pressure disk ruptured (as designed). The release occurred from the second effect vapor body (Tank T-803) of the quadruple effect steam-heated evaporator system located north of Building 374. Approximately 50 gallons of laundry wastewater was released to the secondary containment berm, and approximately 5 gallons was sprayed on the dirt road immediately north of the bermed area. The wetted area on the road was estimated to be approximately 10 by 12 ft; however, the majority of the liquid was observed within a 4-ft² area (DOE 1995).

The material released was a mixture of the evaporator process aqueous waste feeds. The EPA waste codes assigned to the waste treated in the evaporator system include D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F003, F005, F006, F007, F009, and F039. This characterization was based on the constituents that could be present in the waste streams to the evaporator system, as well as characterization of the remaining brine solutions when the process was complete (DOE 1995).

The evaporator system was immediately shut down and actions were taken on November 17, 1994, to remove the liquid and contaminated soil. Approximately 80 to 90 lbs of soil was removed and managed as low-level mixed hazardous waste in RCRA Unit No. 374-380 in Building 374. On November 18, 1994, two sets of composite soil samples were collected in

accordance with the RCRA Permit, Section VI(D)(4)(b)-Sampling. One set of samples were collected from the soil remaining after the wetted soil had been removed. Another set of samples were collected adjacent to the wetted area, along the western side, to determine whether pre-existing contamination was present from past releases in this area, specifically PAC 300-706. The evaporator system was repaired and placed back into service on November 19, 1994 (DOE 1995).

Due to the weather conditions at the time of the incident, the surface of the soil was frozen and the likelihood of vertical or lateral contaminant migration was minimal. Significant effort was required using shovels and a rock bar to loosen and remove the frozen soil that had been wetted by the spill. Validated analytical results from samples collected on November 18, 1994, indicated soil concentrations from both the cleanup area and adjacent area were below or equal to the analytical detection limits (DOE 1995).

A RCRA CPIR Report (No. 94-012) for this incident was submitted to CDPHE.

PAC Investigations

No further investigations of this PAC were necessary.

No Further Accelerated Action Recommendation

Sampling conducted immediately following the removal of soil affected by the spill confirmed that the cleanup was effective and no further removal was required. Therefore, no further action was recommended for PAC 300-714.

After a review of PAC 300-714 information presented in the Tenth Quarterly Update to the HRR (DOE 1995) by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-714 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1995, Historical Release Report Tenth Quarterly Update – September 30, 1994 to December 31, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 300-715

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Battery Acid Spill

This Final Update to the HRR for PAC 300-715 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 300-715 is summarized in this update. The following HRR volumes contain PAC 300-715 information:

Original Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

June 11, 1997

Historical Summary

The location of PAC 300-715 is shown on Figure 16. On June 11, 1997, a forklift operator was moving a wooden pallet loaded with lead-acid batteries north of Building 371. Eight of the batteries shifted and fell, resulting in a spill of sulfuric acid. Five of the eight batteries cracked, releasing their contents, while the other three leaked from their portholes (DOE 1997).

Initial radiological screening was performed and soil/liquid pH samples were collected confirming the presence of dilute levels of sulfuric acid. Sodium bicarbonate was used to neutralize the acid prior to containerization. An estimated 3 gallons of acid were neutralized (DOE 1997).

The damaged batteries were placed in secondary containment for further neutralization. Gravel and soil from the spill site were containerized and soil samples were collected and analyzed for metals. The soil analysis revealed no metal contamination. Lead levels were typical of background and the only elevated results were for sodium (due to the use of sodium bicarbonate). The batteries were transported to their original destination for recycling (DOE 1997).

All areas affected by the sulfuric acid were remediated. During the cleanup, an asphalt pad was discovered at approximately a 6-inch soil depth, which prevented further downward migration of the spill. No other contaminants were associated with the release and sampling verified the effectiveness of remediation (DOE 1997).

PAC Investigations

Results for soil samples collected after the cleanup indicated the cleanup was effective and no further investigations were necessary.

No Further Accelerated Action Recommendation

No further action was recommended based on the small quantity spilled and the thoroughness of the neutralization and containerization procedures followed. Subsequent soil sampling confirmed that the site was remediated.

After a review of PAC 300-715 information presented in the HRR 1997 Annual Update (DOE 1997) by regulatory agencies, DOE received approval from EPA and CDPHE (the LRA) of the NFAA status for PAC 300-715 (CDPHE and EPA 1999).

Comments

None

References









CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.


DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Figure 18
HRR 400 Area
IHSSs and PACs

KEY

-  Stream
-  Dirt road
-  PAC
-  IHSS
-  HRR area
-  Lake
-  Asphalt
-  Building



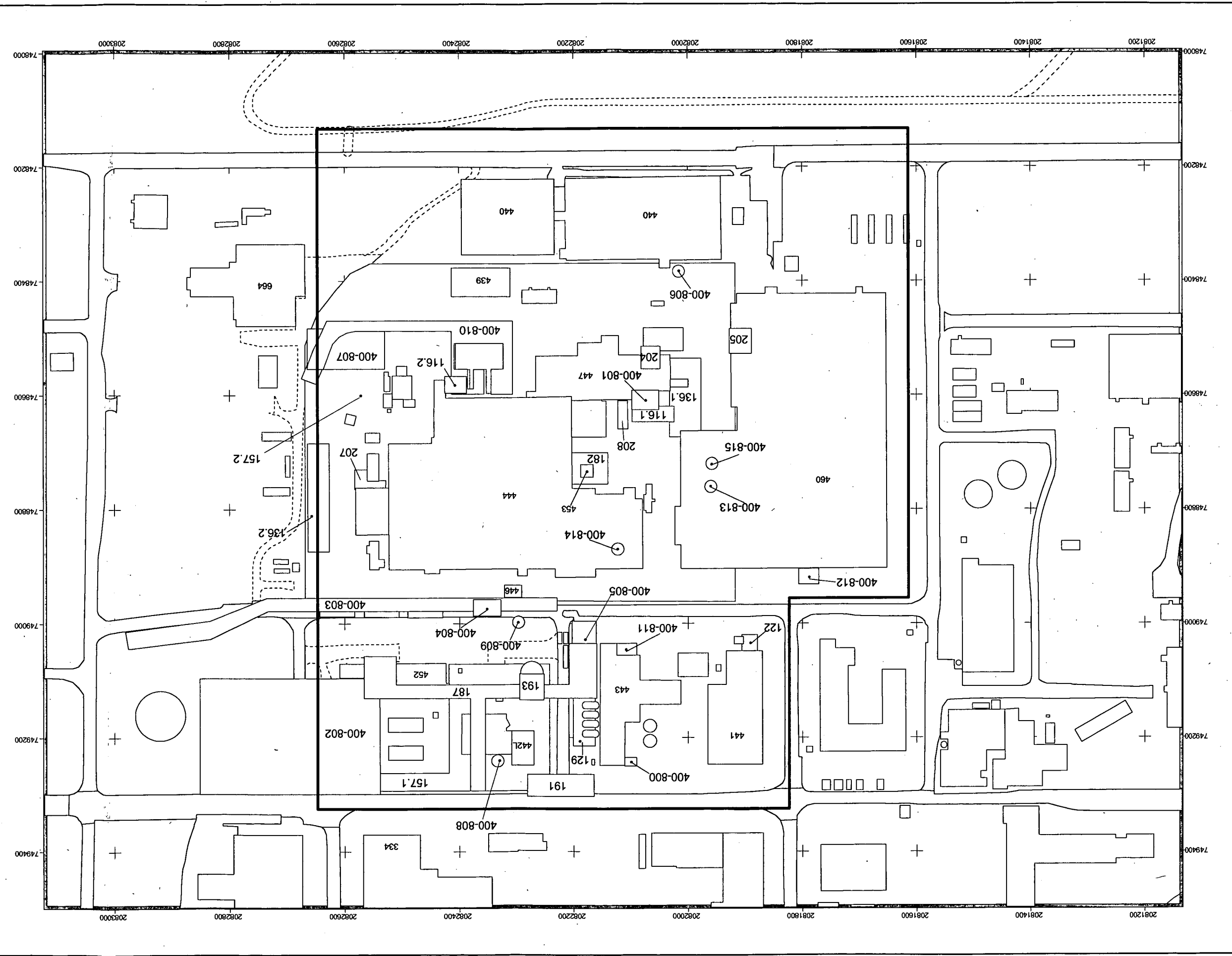
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150 0 150 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 09.28.05



PAC REFERENCE NUMBER: 400-116.1

IHSS Number: 116.1
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 400-3
Unit Name: West Loading Dock – Building 447

The Final Update to the HRR for PAC 400-116.1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 116.1 is summarized in this update. The following HRR volumes contain IHSS 116.1 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1956 to December 2003

Historical Summary

The west loading dock was located on the northern side of Building 447 and west of Building 444. Figure 18 illustrates IHSS 116.1's location with respect to Building 447 and the rest of the 400 Area. Manufacturing operations conducted in both buildings dealt mainly with beryllium and depleted and enriched uranium. Drums containing nonradioactive solvents may have been stored on the dock. Building 453, located in the alcove formed by Buildings 447 and 444, was known to have stored oil (PAC 400-182), and it is not known if these oils were contaminated. Spills and leaks could have impacted the soil and groundwater beneath the dock (DOE 1992).

No documentation was found detailing releases on the west loading dock itself; however, records indicated that oil was applied around Building 453, located just north of the dock, to suppress dust. A possibility existed that solvents were stored at this site as well as the south loading dock and because of the nature of operations in Buildings 447 and 444, infiltration of radioactive materials into the surrounding soil could have occurred.

A radiological survey was conducted around Buildings 444 and 447 during April and May 1984 to determine if surface area were contaminated with plutonium. Areas south of Building 447, west of Building 447, and north of Building 453 were identified as areas that could not be surveyed because of high background radioactivity (DOE 1992).

As a part of closure, Building 447, including the West Loading Dock, was demolished in December 2004 (DOE 2005a).

IHSS Investigations

During 1993, four surface soil samples were collected around IHSS 116.1 in accordance with the OU 12 RFI/RI Work Plan (DOE 1992b). All contaminant activities and concentrations were less than the proposed RFCA WRW soil ALs (DOE et al. 2003). Only radionuclides were detected above background means plus two standard deviations.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), accelerated action soil samples were collected at five surface and subsurface locations in 2003. COCs include radionuclides, metals, VOCs, and PCBs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2003b). Radionuclides and metals were detected above background means plus two standard deviations. The highest radionuclide activities were uranium-234 and uranium-238 detected in surface soil at 4.41 pCi/g. RFCA WRW soil ALs for uranium-234 and uranium-238 are 300 and 351 pCi/g, respectively. Beryllium was detected at four of the five surface soil locations with a maximum concentration of 1.5 mg/kg. The WRW soil AL for beryllium is 921 mg/kg.

No Further Accelerated Action Recommendation

Based on analytical results and the SSRS, action was not required and an NFAA determination was justified for IHSS 116.1, because of the following:

- All COC concentrations in soil were less than the WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the area is not prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS 116.1. Groundwater contamination beneath this IHSS is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005b).

After review of the Data Summary Report by the regulatory agencies, the DOE received approval from CDPHE, the LRA, of the NFAA status for IHSS 116.1 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, Rocky Flats Plant 400/800 Areas, Operable Unit 12, September.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-116.2

IHSS Number: 116.2
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 400-3
Unit Name: South Loading Dock, Building 444

The Final Update to the HRR for PAC 400-116.2 consolidates the information in the initial 1992 HRR and subsequent update with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 116.2 is summarized in this update. The following HRR volumes contain IHSS 116.2 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1953 to April 2005

Historical Summary

The south loading dock was located on the southern side of Building 444 and east of Building 447. Figure 18 illustrates IHSS 116.2's location with respect to Building 444. Many incidents contributed to possible contamination in this area. In 1953, high winds blew the lids off drums stored there releasing uranium to the dock, sidewalks, and driveways. This incident resulted in direct uranium activity readings as high as 7,500 dpm/100 cm² and smear readings with a maximum of 350 dpm. In 1953, the dock and sidewalks were cleaned and the driveway was seal-coated.

On August 30, 1954, while vacuuming in a centrifuge, the motor of the portable vacuum cleaner short-circuited, and the metal chips in the vacuum cleaner bag ignited. The vacuum cleaner was taken to the dock (known then as Dock No. 2). To extinguish the fire, the bag's contents were transferred to a steel drum, and metal powder was added. This addition of metal caused an exothermic reaction and the release of metal oxide to the outside atmosphere. The release covered the dock and adjacent areaway with the metal oxide. The areaway was the entrance to the basement. Radiological air monitoring results on the dock during extinguishing operations were as high as 33,000 percent of the maximum permissible limit (MPL). Direct radiological contamination in the dock area was measured as high as 1,372 dpm. After the vacuum cleaner incident, the dock was cleaned; however, the basement was not decontaminated (DOE 1992).

In October 1955, a 55-gallon drum of perclene still bottoms and nitric acid stored on the dock leaked and sprayed its contents onto two workers who were in the areaway adjacent to the dock. There is no discussion of cleanup in the reference pertaining to the perclene drum leak in 1955; however, the leaks were plugged and the drum was moved. The contents of the drum were transferred to a stainless steel drum and treated with caustic.

Until 1970, chlorinated hydrocarbon solvents used to rinse beryllium parts were dumped on the ground outside Room 106, which opened to the dock. Constituents that may have contaminated

soil around the south dock included enriched and depleted uranium, beryllium, and chlorinated hydrocarbon solvents (DOE 1992).

Building 444, and subsequently the South Loading Dock, was demolished in April of 2005 (DOE 2005a).

IHSS Investigations

During 1993, four surface soil samples were collected around IHSS 116.2 in accordance with the OU 12 RFI/RI Work Plan (DOE 1992b)(DOE 2003a). All contaminant activities and concentrations were less than the proposed RFCA WRW soil ALs (DOE et al. 2003). Only radionuclides were detected above background means plus two standard deviations.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), accelerated action soil samples were collected at five surface and subsurface locations in IHSS 116.2. COCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2003b). Radionuclides, metals, and VOCs were detected above background means plus two standard deviations or reporting limits. In one location, uranium-234 was detected at 10.75 pCi/g. The WRW soil AL is 300 pCi/g. Beryllium was detected at a maximum of 4.4 mg/kg in the surface soil. The WRW soil AL for beryllium is 921 mg/kg.

No Further Accelerated Action Recommendation

Based on analytical results and the SSRS, action was not required and a NFAA determination was justified for IHSS Group 400-3, which includes IHSS 116.2, because of the following:

- COC concentrations in soil were less than RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the area is not prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS 116.2. Groundwater contamination beneath this IHSS was considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005b).

After review of the IHSS Group 400-3 Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA status for IHSS 116.2 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, 400/800 Areas, Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, August 1, 2003 through October 1, 2004, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-122

IHSS Number: 122
Current Operable Unit: IA
Former Operable Unit: 9
IHSS Group: 400-8
Unit Name: Underground Concrete Tanks

The Final Update to the HRR for PAC 400-122 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 122 is summarized in this update. The following HRR volumes contain IHSS 122 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to June 1982

Historical Summary

IHSS 122 is part of the OPWL network of tanks and pipelines (PAC 000-121) located throughout the RFETS IA. The tanks and the OPWL associated with IHSS Group 400-8, were used to handle waste from Buildings 122, 123, and 441. Figure 18 illustrates IHSS 122's location with respect to Building 441 and the 400 Area.

IHSS 122 partially underlies Building 441 and extends south of the building, encompassing Tanks T-2 and T-3 which were installed in 1952. Originally, the tanks were located approximately 60 ft south of Building 441, but in 1966 an addition was constructed over approximately 7.5 ft of the northern part of the tank system (DOE 2001a). Tanks T-2 and T-3 were two interconnected underground concrete tanks. Their combined capacities were approximately 12,000 gallons (DOE 1996).

Tank T-2, the northern tank, was a two-chambered tank with a 3,000-gallon capacity. The two chambers consisted of a wet well for settling and a chamber containing a limestone bed for pH control. Tank T-3 was located underground directly outside the modern Building 441 footprint. Its capacity was 9,000 gallons. Flow was from the wet well (Tank T-2) to the limestone bed (Tank T-2) and then to the holding tank (Tank T-3).

These tanks reportedly received waste streams that included acids, bases, solvents, radionuclides, metals, thiocyanate, ethylene glycol, trace PCBs, bleach, soap, blood, and hydrogen peroxide. Tank T-3 reportedly last stored ammonia after storing several other wastes. At times the tanks were known to have filled with groundwater, which was pumped out and sent to waste treatment. Documentation was found for only one surface release from these tanks. On June 1, 1953, the tanks overflowed by approximately 1,200 gallons. The spill consisted of process waste from Building 123. In 1953, the system was modified to allow liquid wastes to be released directly to

the sanitary system therefore reducing the amount of waste passing through these tanks (DOE 1992a).

The concrete tanks were abandoned in June 1982 after reportedly being decontaminated, filled with gravel, and covered with concrete. However, no gravel was present in or around the tanks during their final removal in November and December 2003. Both tanks had concrete covers and Tank T-3 had been previously pumped, cleaned of sludge, rinsed, and filled with polyurethane foam (DOE 1996). Tank T-2 contained residual liquid, sludge, and limestone and had not been foamed.

IHSS Investigations

HPGe surveys were conducted in accordance with the OU 9 RFI/RI Work Plan (DOE 1992b), and results indicated thorium-232 activity was slightly greater than background levels. Sodium iodide surveys indicated six locations had activities greater than background levels. Surface soil samples were also collected and analyzed, and americium-241 and plutonium-239/240 activities were greater than background levels (DOE 2002).

Surface and subsurface soil samples collected in 1995 from 14 locations adjacent to Tanks T-2 and T-3 indicated americium-241, plutonium-239/240, metals, VOCs, SVOCs, pesticides, and PCBs were present at concentrations greater than background means plus two standard deviations (DOE 2001b). Lead concentrations were 1,410 and 7,810 mg/kg, and the WRW soil AL is 1,000 mg/kg (DOE et al. 2003). Uranium-233/234, uranium-235, and uranium-238 were detected in liquid samples collected from the Tank T-2 vault (DOE 2001a).

In accordance with IASAP Addendum #IA-03-01 for IHSS Group 400-8 (DOE 2002), accelerated action characterization samples were collected from three subsurface locations and analyzed for metals, nitrate, VOCs, and SVOCs in 2003. One of the samples was also analyzed for radionuclides and PCBs. All contaminant activities and concentrations were less than RFCA WRW soil ALs, with one exception (DOE 2004b). Sampling Location BV38-002 at 10 to 11 ft bgs had a benzo(a)pyrene concentration of 3,700 µg/kg, and the AL is 3,490 µg/kg.

In accordance with ER RSOP Notification #03-06 (DOE 2003), Tanks T-2 and T-3, associated OPWL, and the lead-contaminated soil identified during 1995 were removed (DOE 2004b). Prior to removal of Tank T-2, residual liquid, sludge, and other material were sampled, removed, and packaged as low-level mixed waste. OPWL were tapped and drained prior to removal. The excavation to remove the lead-contaminated soil was 4 ft by 4 ft by 2 ft deep. Four confirmation samples were collected from two locations within the excavation (two intervals were sampled from each location). Analytical results indicated all residual contaminant activities and concentrations were less than WRW soil ALs. Residual contaminants included uranium isotopes (uranium-234 and uranium-238 at 3.282 pCi/g), metals (lead at 39.00 mg/kg), VOCs, and SVOCs (benzo(a)anthracene at 390 µg/kg).

No Further Accelerated Action Recommendation

A RFCA (DOE et al. 1996) accelerated action was implemented in accordance with ER RSOP #03-06 (DOE 2003). Based on the removal of the tanks, OPWL, and lead-contaminated soil; residual soil concentrations; and the SSRS, further action is not required and a NFAA determination is justified for IHSS 122.

After review of the Closeout Report by the regulatory agencies, the DOE received approval from the CDPHE, the LRA, of the NFAA status for IHSS 122 on March 19, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 400-8 (B441) - Approval, March 19.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1994, Technical Memorandum No. 1 Addendum to Phase I RFI/RI Work Plan Field Sampling Plan Original Process Waste Lines Volume I- Tanks Part A - Outside Tanks (Operable Unit No. 9), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1996, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001a, Industrial Area Sampling and Analysis Plan, Appendix C, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001b, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004a, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 400-8, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-129

IHSS Number: 129
Current Operable Unit: IA
Former Operable Unit: 10
IHSS Group: 400-7
Unit Name: Oil Leak

The Final Update to the HRR for PAC 400-129 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 129 is summarized in this update. The following HRR volumes contain IHSS 129 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 1997 Annual (DOE 1997).

Date(s) of Operation or Occurrence

1952 to 1997 (Tanks #1 - #3)

1967 to 1986 (Tank #4)

Historical Summary

Four No. 6 fuel oil supply tanks were located east of Building 443, two of which were installed in 1952 and two in 1967. They measured approximately 11 ft by 20 ft and were buried under 2 ft of soil. The tanks were used as local supply tanks to Building 443 (Steam Plant) when natural gas was unavailable. Releases of No. 6 fuel oil were known to have occurred from filling operations and related maintenance since the tanks were first installed (DOE 1992a). Figure 18 illustrates IHSS 129's location with respect to Building 443 and the 400 Area.

From 1952 to 1967, fuel was transferred from the larger tanks south of Building 551 to tanker trucks which in turn transferred the fuel to the supply tanks. Small spills were noted during this process. This practice ceased when underground transfer lines were installed in 1967. In November 1977, a leak in the underground transfer line was discovered. No documentation was found that detailed the quantity of oil released to the environment or a response to the cracked pipe; however, the sewage treatment plant was able to recover 600 gallons of oil. Since 1983, above ground transfer lines have been used (DOE 1992a).

Contamination in the area became evident on March 6, 1986, when compressor oil was found at the bottom of a 4 1/2-ft deep excavation located in the vicinity of the tanks. Three days later, No. 6 fuel oil was discovered in another excavation. Samples of the oil found in the excavations were analyzed. The primary constituent was No. 6 fuel oil with traces of No. 2 diesel oil. Results also showed trace amounts of 1,1,1-trichloroethane (DOE 1992a).

On February 6, 1989, the level indicator in one of the tanks failed while it was being filled, allowing approximately 500 gallons of No. 6 fuel oil to be released to the immediate area and onto Fifth Street. The spill did not reach a drainage or watercourse. The oil was left on the

ground until the next day to let it solidify in the cold. Four days later, 50 more gallons were spilled because the valves were left open. On July 29 and 30, 1989, 1,700 gallons were again released to the environment. No documentation could be found which detailed the cause of the spill (DOE 1992a).

During 1996 Tank #4 was emptied, cleaned, and filled with foam resulting in RCRA stable status (DOE 1996a, 1997).

IHSS Investigations

During 1993, 13 surface soil samples were collected and analyzed in accordance with the OU 10 RFI/RI Work Plan (DOE 1992b) to characterize IHSS 129. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003; DOE 2004).

In accordance with IASAP Addendum #IA-02-05 for IHSS Group 400-7 (DOE 2002a), accelerated action characterization samples were collected and analyzed in 2002. Notification of planned accelerated action activities was provided in the ER RSOP Notification #02-06 (DOE 2002b).

Radionuclides, metals, TPHs, and VOCs were considered PCOCs for IHSS 129. Surface and subsurface samples were collected from 21 sampling locations to characterize IHSS 129. The RFCA Attachment 13 (DOE et al 1996) TPH standard (5,000 µg/kg) was exceeded at nine subsurface locations. The highest TPH concentration detected was 467,000 µg/kg (DOE 2004).

The four tanks were removed and disposed as sanitary waste during the IHSS Group 400-7 accelerated action. Prior to removal, remaining oil and water in Tanks #1 – 3 (8,000 gallons from Tank #1, 10,000 gallons from Tank #2, and 12,000 gallons from Tank #3) were pumped and transported to an off-site sanitary landfill. The sludge (consisting of aged No. 6 fuel oil) that remained in the bottom of the three tanks was extracted, characterized and then disposed of off-site as sanitary waste. Tank #4, was removed, size-reduced, and disposed of as sanitary waste. The tank concrete supports were left in place, 12 to 15 ft below ground surface (DOE 2004).

Oil-contaminated soil (approximately 13,000 cy) was removed, as well as NPWL, valve vaults, steam and water lines, sanitary and storm drains, two underground emergency generator diesel storage tanks and associated fuel lines, asbestos insulation, small concrete structures, and asphalt in the vicinity. The excavation around the tanks was approximately 4,000 ft² and as deep as 22.5 ft bgs, and the excavation along the steam line extended east approximately 130 ft (Figure 8, DOE 2004). Sixteen confirmation samples were collected, indicating all contaminant activities and concentrations were less than the WRW soil ALs and TPH soil standard.

No Further Accelerated Action Recommendation

A RFCA (DOE et al. 1996) accelerated action was implemented in accordance with ER RSOP #02-06 (DO 2002b). Further action was not required and a NFAA determination was justified for IHSS 129, because of the following (DOE 2004):

- All ER RSOP (DOE 2002b) and remediation goals established for IHSS 129 soil were achieved.
- Potential sources of contamination that existed in IHSS 129 were removed, including all four fuel oil tanks and the oil-contaminated soil.

- Residual surface and subsurface COC concentrations were less than RFCA WRW soil ALs and TPH soil standard.
- Excavations were backfilled with clean fill to current grade.

After review of the Closeout Report by the regulatory agencies, the DOE received approval from the CDPHE, the LRA, of the NFAA status for IHSS 129 on January 10, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO; from S. Gunderson, CDPHE; Re: Closeout Report for IHSS Group 400-7 (B442 & 443) – Approval, January 10.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan Other Outside Closures, Operable Unit 10, Rocky Flats Plan, Golden, Colorado, May.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002a, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-05, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-06 IHSS Group 400-7, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Closeout Report for IHSS Group 400-7, UBC 442, IHSS 400-129, IHSS 400-157.1, and IHSS 400-187, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modification to Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBERS: 400-136.1 and 400-136.2

IHSS Number: 136.1 and 136.2
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 400-3
Unit Name: 400-136.1 – Cooling Tower Pond West of Building 444
400-136.2 – Cooling Tower Pond East of Building 444

The Final Update to the HRR for PACs 400-136.1 and 400-136.2 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 136.1 and 136.2 is summarized in this update. The following HRR volumes contain IHSS 136.1 and 136.2 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1956 to 1969

Historical Summary

Historical documentation stated that there were three cooling water ponds located in the vicinity of Building 444; however, documentation was found during the HRR research that supported the location and existence of only two ponds (DOE 1992). Figure 18 shows IHSS 136.1's and 136.2's location with respect to Buildings 444 and 447.

One pond west of Building 444 (IHSS 136.1) can be clearly seen in an aerial photograph taken in 1964. Another pond was excavated east of the Building 444 (IHSS 136.2) exclusion area fence and railroad spur. It was used May 25, 26, and 27, 1956, by an outside contractor (Dowell) to collect the various solutions used during cleaning of the cooling tower. In September 1956, when the liquid had evaporated and percolated away, the pond was backfilled (DOE 1992a).

On December 2, 1958 cooling water from Building 447 was pumped to a surface ditch and allowed to flow across Plant site. The reference for this release indicates the pond east of Building 444 should have been used in this instance because it had been used in the past for drainages and flushing of the cooling tower. It is possible that this reference was to the pond used by Dowell in 1956 (DOE 1992a).

The main purpose of these ponds was to hold cooling tower blowdown from Buildings 444 and 447. This liquid probably contained chromates because hexavalent chromium was commonly used in cooling towers as a corrosion inhibitor until the early 1970s. Lithium and small amounts of depleted uranium may have been placed in these sites (DOE 1992a).

IHSS Investigations

During 1993, five surface soil samples were collected around IHSS 136.1 and 24 surface soil samples were collected around IHSS 136.2 in accordance with the OU 12 RFI/RI Work Plan (DOE 1992b). All contaminant activities and concentrations were less than the proposed RFCA WRW soil ALs (DOE et al. 2003; DOE 2003a). Only radionuclides were detected above background means plus two standard deviations.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), which includes IHSSs 136.1 and 136.2, accelerated action soil samples were collected at 13 surface and subsurface locations in 2003. COCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2003b). Uranium isotopes were detected in surface and subsurface soil at IHSS 136.1 (maximum concentrations were uranium-234 and uranium-238 at 8.92 pCi/g); chromium (36 mg/kg) and lithium (38 mg/kg) were detected in surface soil at IHSS 136.1. Uranium isotopes (uranium-234 and uranium-238 at 9.74 pCi/g), chromium and lithium (130 and 50 mg/kg, respectively) were detected in surface soil at IHSS 136.2, and uranium isotopes and lithium (uranium-234 and uranium-238 9.57 pCi/g and lithium 59 mg/kg) were detected in subsurface soil at IHSS 136.2.

No Further Accelerated Action Recommendation

Action was not required and a NFAA determination was justified for IHSSs 136.1 and 136.2, because of the following:

- COC concentrations in soil were less than the RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the area is not prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSSs 136.1 and 136.2. The groundwater contamination beneath this IHSS is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005).

After review of the Data Summary Report by the regulatory agencies, the DOE received approval from CDPHE, the LRA, of the NFAA status for IHSSs 136.1 and 136.2 on December 18, 2003 (CDPHE 2003).

Comments

None

References

- CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18.
- DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.
- DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, 400/800 Areas, Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-157.1

IHSS Number: 157.1
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 400-7
Unit Name: Radioactive Site North Area

The Final Update to the HRR for PAC 400-157.1 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 157.1 is summarized in this update. The following HRR volume contains IHSS 157.1 information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

1953 to approximately 1972

Historical Summary

Building 442 functioned as a laundry facility for contaminated clothing. It was in use from 1953 until approximately 1972 when it was converted to a filter-testing laboratory. As early as September 1953, contamination associated with the handling and steaming of contaminated rags was detected in the soil around the building. A survey conducted on October 14, 1953, in the ditches north and west of Building 442 encountered 500,000 dpm/kg in soil (DOE 1992a) (DOE 2004). Figure 18 illustrates IHSS 157.1's location with respect to the rest of the 400 Area. The Site survey Annual Report for 1954 stated that soil contamination in the ditches near Building 442 was 10 times greater than background. In September 1959, a high count was detected on a smear sample from the Building 442 dock. Subsequently, the area was decontaminated. In December 1963, a barrel of cleaning rags containing solvents and radioactive metal shavings either leaked or spilled, and liquid drained east into the ditch on the northwestern side of the building. Radioactivity was detected as far as the east end of Building 555. Surface radioactivity in the affected areas and around Building 442 was removed to background levels (DOE et al. 2003; DOE 2004).

IHSS Investigations

During 1993 seven surface soil samples were collected within the IHSS and analyzed for radionuclides, metals, VOCs, and SVOCs in accordance with the OU 13 RFI/RI Work Plan (DOE 1992b). All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2004).

In accordance with IASAP Addendum #IA-02-05 for IHSS Group 400-7 (DOE 2002a), accelerated action characterization samples were collected and analyzed in 2002. Notification of planned accelerated action activities was provided in ER RSOP Notification #02-06 (DOE 2002b).

Radionuclides, metals, VOCs, and SVOCs were considered PCOCs for IHSS 157.1. Surface and subsurface soil samples were collected from 45 sampling locations to characterize IHSS 400-157.1. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with three exceptions. At one location the benzo(a)pyrene concentrations at the surface and subsurface intervals exceeded the WRW soil AL (3,490 µg/kg). Concentrations were 10,000 and 14,000 µg/kg, respectively. At the same location, the dibenz(a,h)anthracene concentration at the subsurface interval (0.5-0.8 ft bgs) was 3,900 µg/kg, and the AL is 3,400 µg/kg. At another location, the benzo(a)pyrene concentration at the subsurface interval (0.5-2.5 ft bgs) was 3,500 µg/kg (DOE 2004).

Based on the detected WRW soil AL exceedances, soil was removed from the two locations. Approximately 18 to 24 inches of soil in a 3-ft-diameter circle were removed from each location (Figure 8, DOE 2004). Confirmation sampling results indicate that all contaminant activities and concentrations are less than WRW soil ALs. Figure 8 of the IHSS Group 400-7 Closeout Report illustrates the areas of excavation (DOE 2004).

No Further Accelerated Action Recommendation

A RFCA (DOE et al. 1996) accelerated action was implemented in accordance with ER RSOP #02-06 (DOE 2002b). Further action was not required and a NFAA determination was justified for IHSS 157.1, because of the following (DOE 2004):

- All ER RSOP (DOE 2002b) and remediation goals for IHSS 157.1 soil were achieved.
- Potential sources of contamination that existed greater than RFCA WRW soil ALs in IHSS Group 157.1 were removed.
- Residual surface and subsurface COC concentrations were less than RFCA WRW soil ALs.
- Excavations were backfilled to current grade.

Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in the IHSS. Groundwater contamination beneath this IHSS is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005).

After review of the Closeout Report by the regulatory agencies, the DOE received approval from the CDPHE, the LRA, of the NFAA status for IHSS 157.1 on January 10, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO; from S. Gunderson, CDPHE; Re: Closeout Report for IHSS Group 400-7 (B442 & 443) – Approval, January 10.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, Rocky Flats Plant 100 Area, Operable Unit 13, Rocky Flats Plant, Golden, Colorado, October.

DOE, 2002a, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-05, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-06 IHSS Group 400-7, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Closeout Report for IHSS Group 400-7, UBC 442, IHSS 400-129, IHSS 400-157.1, and IHSS 400-187, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-157.2

IHSS Number: 157.2
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 400-6
Unit Name: Radioactive Site South Area

The Final Update to the HRR for PAC 400-157.2 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 157.2 is summarized in this update. The following HRR volume contains IHSS 157.2 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1953 to 2004

Historical Summary

The Radioactive Site South Area (IHSS 157.2) includes the soil and paved area surrounding Buildings 444, 447, 440, and 439. IHSS 157.2 site boundaries were expanded to include the area adjacent to and surrounding the buildings to include other activities that took place in the general area that characterize this site (DOE 1992a). Figure 18 illustrates IHSS 157.2's location with respect to Buildings 444 and 447 and the rest of the 400 Area. IHSS 157.2 is the only site in IHSS Group 400-6.

Operations in Building 444 mainly included a depleted uranium foundry, a carbon machining shop, and beryllium fabrication. Prior to 1973, the soil surrounding Buildings 444, 447, 440, and 439 was known to contain low levels of uranium and chemical contamination. VOCs and hydrocarbons originating from the uranium machine tool storage area may have been present in Buildings 439 and 440 soil.

Several operations associated with Building 444 contributed to contamination in the area. Probably the most significant contamination occurred near the south dock where solvents, used to rinse beryllium parts, were dumped onto the ground. Additional details regarding the activities that took place on the dock are described in PAC 400-116.2. In March 1954, soil samples, from a ditch south of Building 444, indicated contamination, caused by washing the dock and apron, at levels twice that of background. Another reference states that sampling conducted in 1954 indicated soil activity levels 3 times that of background in a ditch south of Building 444 (DOE 1992a).

Material storage in an open ingot storage area east of Building 444, a metal storage area to the south of the building, and a uranium machine tool storage area to the west may have resulted in low-level radionuclide contamination of the soil. There have also been cooling tower ponds in the area that are described in PAC 400-136 (DOE 1992a).

Numerous incidents are mentioned in documents found during the 1992 HRR (DOE 1992a) search that indicated contamination releases to the area; however, the documentation provides few details. The documented incidents include the following:

- In May 1960, a vacuum collector fire in Building 447 resulted in the release of approximately 44 μCi of depleted uranium that was deposited on the roof of the building.
- In December 1962, a uranium and beryllium release from Building 444 occurred through an unfiltered hood.
- In June 1966, a process waste line north of Building 444 broke.
- On November 11, 1974, 170 ft^2 of road south of Building 444 (probably Cedar Avenue) was contaminated when a barrel containing uranium chips was dropped during transfer.
- Rocky Flats photographs taken in 1978 show poor housekeeping in the area north of Building 440. The area was littered with miscellaneous materials such as pallets, open paint cans, machinery, and cargo containers.
- On February 23, 1978, a fire in the air plenum south of Building 444 that serviced the beryllium machining operations in Room 107 resulted in the release of an estimated 14.5 grams of beryllium. Details of this fire and the associated cleanup are described in PAC 400-810.
- An incident occurred on November 4, 1985 involving pressurization of a process line in Building 447. The pressure forced liquid through a floor drain and up the vent pipe onto the roof where it ran into the gutter and onto the ground below. Contamination levels were as high as 10,000 cpm beta activity. Contaminated surfaces were decontaminated to less than 250 cpm or painted to contain the radioactivity. The drain that was involved was to have been relocated and a ball check valve installed on the vent pipe (DOE 1992a).
- On November 30, 1990, during the transfer of three drums across plant site, personnel detected radioactivity on one drum containing beryllium ingots. Staging areas along the transfer route were smeared for radioactivity. One high result (greater than 25 counts per minute per square foot [cpm/ft^2]) was detected just outside the beryllium machine shop (Building 444) at the exit/entrance door.

The principle materials that contributed to contamination in the area around Building 444 are depleted and enriched uranium, beryllium, chlorinated solvents, and hydraulic oil. Lithium and chromium were also detected under the cooling tower ponds (PAC 400-136.1 and 400-136.2). No documentation was found that indicated cleanup of any of the minor incidents.

Demolition of Building 447 was complete in December 2004 and demolition of Building 444 was complete in April 2005 (DOE 2005).

IHSS Investigations

During 1993 and 1994, surface and subsurface soil and sediment samples were collected within IHSS 157.2 in accordance with the OU 12 RFI/RI Work Plan (DOE 1992b). Samples were analyzed for the PCOCs, radionuclides, metals, VOCs, and SVOCs. All contaminant activities and concentrations in surface soil and sediment were less than RFCA WRW soil ALs (DOE et al. 2003). One subsurface sample (at 0.0-6.0 ft bgs) had a chromium concentration greater than the WRW soil AL (408 vs. 268 mg/kg).

Accelerated action characterization activities were conducted at IHSS 157.2, in accordance with the IASAP Addendum #IA-03-14 (DOE 2003). Based on IHSS 157.2, site histories and historical soil sampling results, radionuclides, metals, pesticides, PCBs, SVOCs, and VOCs were identified as PCOCs. Surface and subsurface soil samples (449 samples from 202 sampling locations) were analyzed for PCOCs during characterization activities. Three COCs (arsenic, benzo[a]pyrene, and dibenzo[a,h]anthracene) were detected in subsurface soil at concentrations greater than RFCA WRW soil ALs at 24 mg/kg, 15,000 µg/kg, and 3,600 µg/kg, respectively. The accelerated action characterization activities conducted at IHSS Group 400-6 and the complete rationale for a NFAA decision at IHSS 157.2 are discussed in detail in the Data Summary Report for IHSS Group 400-6 (DOE 2004b).

No Further Accelerated Action Recommendation

NFAA was recommended for IHSS 157.2 based on the following:

- Concentrations of COCs were not detected at concentrations or activities greater than RFCA WRW soil ALs except for arsenic, benzo(a)pyrene, and dibenz(a,h)anthracene. The concentrations of arsenic and dibenz(a,h)anthracene were only slightly greater than the WRW soil ALs. Benzo(a)pyrene was detected at approximately 4 times the WRW soil AL, but this was an isolated detection in the subsurface.
- Based on the SSRS (DOE et. al. 2003), migration of soil contaminants to surface water through erosion is unlikely.

After review of the Data Summary Report by the regulatory agencies, the DOE received approval from the CDPHE, the LRA, of the NFAA status for IHSS 157.2 on September 29, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 400-6, IHSS 205 Radioactive Site South Area, dated September 2004, September 29.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, 400/800 Areas, Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-14, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004a, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 400-6, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-182

IHSS Number: 182
Current Operable Unit: IA
Former Operable Unit: 10
IHSS Group: 400-3
Unit Name: Building 444/453 Drum Storage Area

The Final Update to the HRR for PAC 400-182 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 182 is summarized in this update. The following HRR volumes contain IHSS 182 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

Before 1957 to Unknown

Historical Summary

In May 1957 it was noted that numerous barrels of depleted uranium oxide waste were being stored in the “backyard” of Building 444. The storage was not on a concrete slab and there was concern that the barrels would be subject to corrosion (DOE 1992). Figure 18 illustrates IHSS 182’s location within the 400 Area.

For many years Building 453 was used as an oil storage area. In July 1983, high groundwater forced some of the residual oil that had been spilled over the years out of the ground. Several pools of oil formed adjacent to the building. At that time, 25 barrels of used oil awaiting disposal were being stored outside the building. Low-level oblique photographs taken in 1982 reveal heavy, dark staining around Building 453 and along the western side of Building 444. No documentation was found that detailed what the oil had been used for or whether it was contaminated. As of July 22, 1983, the oil had not been cleaned up.

IHSS Investigations

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), which included IHSS 182, characterization soil samples were collected at seven surface and subsurface locations in 2003. PCOCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2003b; DOE et al. 2003). Uranium isotopes, metals, and VOCs were detected in surface soil. The maximum radionuclide detections were uranium-234 and uranium-238 at 5.38 pCi/g. Maximum relevant metal detections were beryllium and chromium at 1.8 and 28 mg/kg, respectively. VOC maximum relevant detection was tetrachloroethene at 3.3 µg/kg,

Uranium isotopes and VOCs were also detected in subsurface soil. Radionuclide detections were for uranium-234 and uranium-238 at 4.49 pCi/g and VOC relevant detections for tetrachloroethene were at 7.21 µg/kg.

No Further Accelerated Action Recommendation

Action was not required and a NFAA determination was justified for IHSS 182, because of the following:

- COC concentrations in soil were less than the WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the IHSS was not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low contaminant concentrations and activities found in IHSS 182. Groundwater contamination is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005).

After review of the Data Summary Report by the regulatory agencies, the DOE received approval from the CDPHE, the LRA, of the NFAA status for IHSS 182 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-187

IHSS Number: 187
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 400-7
Unit Name: Sulfuric Acid Spill

The Final Update to the HRR for PAC 400-187 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 187 is summarized in this update. The following HRR volume contains IHSS 187 information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

September 11 to 12, 1970

Historical Summary

A 3,000-gallon aboveground tank, approximately 30 ft east of Building 443, was used to store sulfuric acid. The tank did not have secondary containment. At the time of installation, the drain line was equipped with a nonstandard valve and flange. The piping system was hydrostatically tested on July 2, 1970. The tank was filled with water and left for 3 weeks and was determined to have no leaks. After the water was drained from the tank, the valves and gaskets were changed (DOE 1992a). Figure 18 illustrates IHSS 187's location with respect to Building 442 and the 400 Area.

On September 11, 1970, a stream, approximately 1/4 inch in diameter was found spraying out about 4 ft from the flange above the drain valve. Approximately 1,500 gallons of sulfuric acid spilled from the tank and drained eastward through a culvert under Fifth Street and along a ditch south of Building 442, where the acid was captured in an earthen pit and neutralized with approximately 32,000 lbs of lime. Some of the acid also flowed northward along a north-south ditch east of Building 442. A dike was installed to stop the northward flow, and lime was used to neutralize the acid (DOE 1992a).

No documentation was found which detailed the removal of contaminated soil. However, photographs indicate excavation and possible removal of soils immediately adjacent the tank (DOE 1992a).

IHSS Investigations

During 1993, surface soil samples were collected from eight locations in IHSS 187 and analyzed for radionuclides, metals, VOCs, and SVOCs in accordance with the OU 12 RFI/RI Work Plan (DOIE 1992b). Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003; DOE 2004).

In accordance with IASAP Addendum #IA-02-05 for IHSS Group 400-7 (DOE 2002), characterization samples were collected and analyzed in 2002. Surface soil samples were

collected from five sampling locations to characterize IHSS 187. Radionuclides and metals were analyzed. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2004). A uranium-235 activity of 0.4 pCi/g and a strontium concentration of 250 mg/kg were representative of the analytical results. Based on all of the analytical results, IHSS 187 did not require any action.

No Further Accelerated Action Recommendation

No further action was necessary and a NFAA determination was justified for IHSS Group 400-7, which included IHSS 187, because surface and subsurface COC concentrations were less than WRW soil ALs (DOE 2004).

After review of the Closeout Report by the regulatory agencies, the DOE received approval from the CDPHE, the LRA, of the NFAA status for IHSS 187 on January 10, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO; from S. Gunderson, CDPHE; Re: Closeout Report for IHSS Group 400-7 (B442 & 443) – Approval, January 10.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Environmental Restoration Final Phase I RFI/RI Work Plan, 400/800 Areas, Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-05, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004, Closeout Report for IHSS Group 400-7, UBC 442, IHSS 400-129, IHSS 400-187, and IHSS 400-187, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-191

IHSS Number: 191
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: Not Applicable
Unit Name: Hydrogen Peroxide Spill

The Final Update to the HRR for PAC 400-191 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 191 is summarized in this update. The following HRR volumes contain IHSS 191 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and.
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

April 1981

Historical Summary

In April 1981, two 55-gallon drums of 35-percent hydrogen peroxide solution that were being transported by warehouse personnel fell off a pallet. One of the drums burst open and the hydrogen peroxide flowed into a culvert at the corner of Fifth Street and Central Avenue (DOE 1992). Figure 18 illustrates IHSS 191's location with respect to the rest of the 400 Area.

A hole was dug in the Central Avenue ditch east of Fifth Avenue and the area was hosed down allowing the diluted hydrogen peroxide to drain into the hole. The hole was refilled on April 23, 1981. The area has since been paved.

IHSS Investigations

No further investigation was necessary because the hydrogen peroxide would neutralize quickly.

No Further Action Recommendation

Because of the relatively small amount of hydrogen peroxide spilled and the neutralization effect over time, no threat of adverse health effects existed under the exposure conditions evaluated.

The recommendation for NFA at that site was consistent with the criteria for recommending no further action decisions presented in RFCA (DOE et al. 1996). Subsequently, an NFA justification was submitted with the 1997 Annual Update to the HRR.

After reviewing the NFA justification by the regulatory agencies, CDPHE, the LRA, and EPA approved the NFA for IHSS 191 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1997, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 400-193

IHSS Number: 193
Current Operable Unit: IA
Former Operable Unit: 16
IHSS Group: Not Applicable
Unit Name: Steam Condensate Leak

The Final Update to the HRR for PAC 400-193 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 193 is summarized in this update. The following HRR volumes contain IHSS 193 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1996 Annual (DOE 1996).

Date(s) of Operation or Occurrence

During the week ending November 30, 1979

Historical Summary

An above ground steam condensate line located between Building 443 and a valve pit north of a fuel storage tank was found leaking. The area between Building 443 and the valve pit was paved at the time of the leak (DOE 1992a) (DOE 1992b). Figure 18 illustrates IHSS 193's location relative to Building 443 and the rest of the 400 Area.

The line was abandoned in place, and the condensate was rerouted through a different system by November 30, 1979 (DOE 1992a, 1992b). All above ground steam condensate lines were removed as part of RFETS closure efforts.

IHSS Investigations

This IHSS was studied as a part of OU 16 (DOE 1992b). The steam condensate was found to contain 0.135 ppm amines; sampling locations were not identified (DOE 1992a, 1992b).

Although no direct documentation was found that detailed the fate of the amines, it is highly unlikely that any of this chemical remains in the environment from this release. As described in the Final NFA Justification Documentation for OU 16, Low-Priority Sites (DOE 1992b), the amine compound, used as a corrosion inhibitor in steam condensate lines, was diethylaminoethanol. This alcohol-based compound is highly soluble and readily transported in solution by water. At the time, diethylaminoethanol had a permissible exposure limit (PEL) of 10 mg/L, which was one and a half orders of magnitude greater than the concentration found in the steam condensate.

Conclusions were drawn that the initial concentration would have been diluted even further by years of rainfall and runoff, leaving no source present. Without a source, there was no risk to human health or the environment (DOE 1994).

No Further Action Recommendation

Based on the information and conclusions presented in the Final NFA Justification Document for OU 16, Low-Priority Sites (DOE 1992b; 1994), a CAD/ROD recommending no action under CERCLA for IHSS 193 was signed by CDPHE, the LRA, on October 28, 1994.

Comments

CERCLA Five-Year Review: The CAD/ROD for OU (DOE 1994) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1992b, Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Corrective Action Decision/Record of Decision for OU 16: Low-Priority Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1996, Annual Update to the Historical Release Report, August 1, 1995 through August 1, 1996, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 400-204

IHSS Number: 204
Current Operable Unit: IA
Former Operable Unit: 15
IHSS Group: Not Applicable
Unit Name: Original Uranium Chip Roaster (RCRA Unit 45)

The Final Update to the HRR for PAC 400-204 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 204 is summarized in this update. The following HRR volumes contain IHSS 204 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1996 Annual (DOE 1996)
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1956 through 1988

Historical Summary

IHSS 204, the Original Uranium Chip Roaster located in Building 447, was used to oxidize uranium chips coated with small amounts of oils and coolants, converting the elemental uranium to uranium oxide. Oils and coolants with organic solvents may have contained hazardous constituents. The unit was cylindrical with a diameter of 5 ft 6 inches and a height of 7 ft 4 inches. The inlet for the unit was located in Room 502 of Building 447, and the outlet was located directly downstairs in Room 32. The location of IHSS 204 is shown on Figure 18. No hazardous constituents were treated in this unit since January 1988, when the uranium chips processed in the unit were no longer coated with oils and coolants. The Original Uranium Chip Roaster was RCRA Unit 45.

An incident involving the roaster occurred in Room 32 of Building 447 on June 28, 1985, when an operator filled a barrel with hot oxide and, in replacing it with a new barrel, placed the thermally hot barrel next to some cardboard. Approximately 3 hours later, the cardboard burst into flames and set off the sprinklers and fire alarm. Subsequently, the basement of the building flooded (DOE 1996).

IHSS Investigations

IHSS 204 was studied as a part of OU 15, Inside Building Closures (DOE 1995). A total of 77 radiological smear samples were collected from the IHSS, and seven hot-water rinsate samples were also obtained (DOE 1996).

No RCRA-regulated constituents of regulatory concern were identified in the IHSS sampling. No radionuclides detected in the hot-water rinsate samples from IHSS 204 had activities exceeding the permissible radionuclide levels. The pre-rinsate smear samples from the floor surfaces in Rooms 32 and 502 and the outside surfaces of the Chip Roaster inlet and outlet confirmed the

presence of radiological contamination at IHSS 204. Rooms 32 and 502 were posted and managed as radiological controlled areas in accordance with the RFETS Radiological Control Program requirements.

No Further Action Recommendation

The roaster was cleaned and closed in accordance with RCRA in 1995, and radiologically contaminated surfaces were managed as low-level waste during building demolition (DOE 2005). Building 447 was demolished during FY2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP, and as documented in the D&D Closeout Report (DOE 2005).

In accordance with a February 14, 2002 approval letter from CDPHE, the LRA, and EPA, IHSS 204 was approved for NFA (CDPHE and EPA 2002).

Comments

CERCLA Five Year Review: The CAD/ROD for OU 15 (DOE 1995) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1995, Corrective Action Decision/Record of Decision for OU 15: Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 400-205

IHSS Number: 205
Current Operable Unit: IA
Former Operable Unit: 10
IHSS Group: 400-5
Unit Name: Building 460 Sump #3 Acid Site

The Final Update to the HRR for PAC 400-205 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 205 is summarized in this update. The following HRR volume contains IHSS 205 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1984 to 1996

Historical Summary

Sump No. 3 was designated as RCRA Unit No. 8, which operated as a 90-day waste accumulation area and was withdrawn from the RCRA permit in 1995 (DOE 2003). This fiberglass tank was located in the wall of Room 156B in Building 460 and was used as a staging area for acid wastes generated inside the building before the wastes were transferred to the two acid tanks located along the southeastern corner of Building 460. In this same locale were two solvent tanks that operated in the same manner as the acid tanks (DOE 1992). Figure 18 illustrates IHSS 400-205's location with respect to Buildings 460 and the rest of the 400 Area.

As wastes were generated inside Building 460, they were transferred to the sump and on to one of the tanks by a permanent and dedicated piping system for acid only. When one tank became full, a quick disconnect was switched to the other tank. The waste was moved by forklift to Building 374 or Building 774 for treatment or to an adjacent bermed area where the acid was transferred to steel drums with poly-liners. These drums were then stored at the Building 460 Drum Storage Area (DOE 1992).

The capacity of each acid tank was 250 gallons with additional storage available in the acid sump. However, the two tanks were never used at the same time so the total acid stored at any time was less than 250 gallons. Acids contained within this tank were a combination of nitric acid and nitrad (hydrofluoric acid and ammonium salts). The tanks are constructed of 3/16-inch-thick stainless steel and were checked weekly to see if they needed emptying. They were contained within a concrete bermed area that measure 4 ft wide by 6 ft long and 12 inches deep. The bermed area had a capacity of 286 gallons. The acid side was adjacent to the solvent side, but they were distinct and separated by a dividing berm that prohibited mixing. Each bermed area could be drained by removing a drain-hole plug located 1-1/2 inches from the bermed floor (DOE 1992).

On April 10, 1989, one of the tanks was overfilled, releasing 5 to 7 gallons of dilute nitric acid and nitrad waste to a storm drain. When it was discovered that the acid was running to the storm

drain, the HAZMAT Team used containment logs to slow the flow in the storm drain and neutralize the area with a chemical buffer. The acid was allowed to flow through the storm drain and on to Pond C-2(PAC SE-142.11). The acid was diluted by the natural mixing with snow on the ground; therefore, it was anticipated that there would be no environmental impact (DOE 1992).

After the spill in 1989, pH values at the Pond C-2 inlet and at the SID were 6.9. Puddles outside Building 460 had a pH of 2 (DOE 1992).

IHSS Investigations

Accelerated action characterization activities were conducted at IHSS 205 in accordance with IASAP Addendum #IA-03-14 (DOE 2003) in 2003. Based on the IHSS 205 site history, radionuclides, metals, SVOCs, and VOCs were identified as PCOCs. Three surface and subsurface soil samples were collected and analyzed for the PCOCs during characterization activities. Analytical results revealed all PCOCs were less than RFCA WRW soil ALs (DOE et al. 2003). Uranium isotopes (uranium-234 and uranium-238 at 5.346 pCi/g) and metals (beryllium and strontium at 1.1 and 56 mg/kg, respectively) were detected. The accelerated action characterization activities conducted at IHSS Group 400-5 and rationale for an NFAA decision at IHSS 205 are discussed in detail in the Data Summary Report for IHSS Group 400-5 (DOE 2004).

All tanks including Sump #3 were closed in accordance with the RCRA Closure Plan for Building 460. Building 460 was demolished in June 2005 (DOE 2005)

No Further Accelerated Action Recommendation

NFAA was recommended for IHSS 205 based on the following (DOE 2004):

- Activities and concentrations of COCs were uniformly below the RFCA WRW soil ALs.
- Migration of soil contaminants to surface water is unlikely because little contamination is present and based on the SSRS (DOE et al. 2003), IHSS 205 is not located in an area of high erosion.
- Contaminants originating in IHSS 205 soil are not likely to impact surface water via transport in groundwater because soil contamination levels in IHSS 205 are very low.

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA status for IHSS 205 on December 7, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 400-5, IHSS 400-205 – Sump #3 Acid Site, PAC 400-813 and PAC 400-815 – Tank Leaks in Building 460 & Status of “RCRA Unit 8”, December 7.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-14, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004, Data Summary Report for IHSS Group 400-5, IHSS 400-205, PAC 400-813, and PAC 400-815, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005, Building 460 Closeout Report, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-207

IHSS Number: 207
Current Operable Unit: IA
Former Operable Unit: 10
IHSS Group: 400-3
Unit Name: Inactive 444 Acid Tank

The Final Update to the HRR for PAC 400-207 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 207 is summarized in this update. The following HRR volumes contain IHSS 207 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1980 to 1987

Historical Summary

Two 500-gallon stainless steel acid tanks used to store acid waste (RCRA Unit #4) were located east of Building 444. As the waste was generated, it was drained into a small free-standing metal sump tank and then pumped to the tank. Only one tank was filled at a time. The tank receiving waste was placed within a berm with a capacity of 640 gallons. When the tank was full, it was removed with a fork lift and transported to either Building 374 or Building 774. An empty tank was then put within the berm to receive waste (DOE 1992). Site records indicate these tanks were used to support the remediation of OU 15, then removed, cleaned, and retrofitted for use as 90-day accumulation areas for incidental water. Figure 18 illustrates IHSS 207's location within the 400 Area.

The containment berm had interior dimensions of 9 ft by 9.5 ft by 1 ft and was built of asphalt. The types of wastes stored in these containers consisted of acid waste from beryllium machining, electropolishing solution, and wastes from chemical milling. The raw milling acid was a mixture of 75 percent phosphoric acid, 3 percent sulfuric acid, and chromium trioxide. Analytical results indicated the acid waste contained significant amounts of cyanide, cadmium, chromium, lead, silver, and arsenic, and also contained detectable amounts of uranium, americium, and tritium. The tanks and piping were decontaminated and moved to another processing area in 1987 (DOE 1992).

In January, 1981, Rocky Flats staff encountered uranium contamination in the catch basin. The quick disconnect assembly had been replaced without a gasket allowing liquid to leak into the catch basin. The spill consisted of uranium-contaminated process waste. It was cleaned up and a new gasket was installed. The spill was contained within the catch basin.

IHSS Investigations

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), which included IHSS 207, accelerated action soil samples were collected at three surface and subsurface locations in 2003. PCOCs included radionuclides and metals. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2003b; DOE et al. 2003). Uranium and metals were detected in surface and subsurface soil. Maximum detections included uranium-234 and uranium-238 which were detected at 4.91 pCi/g. Aluminum and strontium detections were at 26,000 and 65 mg/kg, respectively. Beryllium and chromium were detected in surface soil only (1.1 and 30 mg/kg, respectively). Arsenic, cadmium, lead, and selenium were not detected.

B444 was demolished in accordance with the RSOP for Facility Disposition, and the Pre-Demolition Survey Report. The RCRA Unit #4 was closed in accordance with the Final Closeout of Buildings 44 and 447 (DOE 2005a).

No Further Accelerated Action Recommendation

Accelerated action was not necessary and an NFAA determination was justified for IHSS Group 400-3, which included IHSS 207, because of the following:

- PCOC concentrations in soil were less than the RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the IHSS was not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS 207. Groundwater contamination beneath this IHSS is considered part of the IA Plume, which was evaluated the Groundwater IM/IRA decision document (DOE 2005b).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA status for IHSS 207 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18, 2004.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June 21.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-208

IHSS Number: 208
Current Operable Unit: IA
Former Operable Unit: 10
IHSS Group: 400-3
Unit Name: Inactive 444/447 Waste Storage Area

The Final Update to the HRR for PAC 400-208 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 208 is summarized in this update. The following HRR volumes contain IHSS 208 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1986 to 1987

Historical Summary

This area, located north of Building 447 and west of Building 444, was used for a short time for hazardous waste storage. Wastes were stored in a 20- ft by 8-ft cargo container with secondary containment. Figure 18 illustrates IHSS 208's location within the 400 Area. This unit was identified as Unit No. 3 in the 1986 RCRA Part B Permit application. The maximum volume of waste stored was 990 gallons. No documentation was found that indicated spills or leaks to the environment in this area (DOE 1992). An Administrative Closure Request was approved on January 21, 2002; the request noted that the cargo container may have been moved to RCRA Unit Number 1 (DOE 2002).

The typical wastes stored in the cargo container included a composite of nitric acid with silver, sodium fluoride solution, plating acids (hydrochloric acid, nitric acid, and hydrofluoric acid) with concentrated chromium plating solution, concentrated cadmium cyanide solution, nickel sulfate, and developer/fixer (DOE 1992).

IHSS Investigations

During 1993, nine surface soil samples were collected within IHSS 208. All contaminant activities and concentrations were less than the proposed RFCA WRW soil ALs (DOE 2003a; DOE et al. 2003). Radionuclides were detected above background means plus two standard deviations at three of the locations. VOCs were detected above detection limits at one of the locations.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), which included IHSS 208, accelerated action soil samples were collected at two surface and subsurface locations in 2003. COCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2003b). Metals, including nickel, were detected at one surface location, and acetone and

uranium-235 were detected at the other surface location. Uranium isotopes and VOCs were detected at the two subsurface locations. Maximum concentrations of uranium-234 and uranium-235 were 4.33 pCi/g and beryllium and chromium were 1.3 and 19 mg/kg, respectively.

At the time of building demolition, the Inactive 444/447 Waste Storage Area was covered with asphalt. As a part of the final demolition of Buildings 444 and 447, the asphalt was removed and the area regarded (DOE 2005a).

No Further Accelerated Action Recommendation

Action was not required and an NFAA determination was justified for IHSS 208, because of the following (DOE 2003b):

- COC concentrations in soil were less than the RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the IHSS was not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS 208. Groundwater contamination beneath this IHSS is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005b).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA status for IHSS 208 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), Rocky Flats Environmental Technology Site, Golden, Colorado, December 18.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, August 1, 2003 through October 1, 2004, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June 21.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

K-H, 2002, Correspondence to J. Schieffelin, CDPHE; from S. Nesta, K-H, RE: Administrative Closure on Interim Status Unit 3 – At Building 444/447, Rocky Flats Environmental Technology Site, Golden, Colorado, January 21.

PAC REFERENCE NUMBER: 400-800

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer 443-1

The Final Update to the HRR for PAC 400-800 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-800 is summarized in this update. The following HRR volumes contain PAC 400-800 information:

Original Report – 1992 (DOE 1992);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

Unknown to 1987

Historical Summary

Originally, Transformer 443-1 was located along the northern wall outside of Building 443. It was then relocated to a newly constructed pad several feet south of the older pad. A concrete berm, surrounding both the old and new pad sites, was at ground level. A secondary berm also surrounded the new pad (DOE 1992). Figure 18 illustrates PAC 400-800's location with respect to Building 443 and the rest of the 400 Area.

The original transformer, which was known to have leaked, was replaced in 1987 (Appendix I, DOE 1992). EPA representatives found a small leak of dielectric fluid on the exterior of this transformer on June 30, 1987. Smears taken from leaks around the top and bottom valves, level gauge, and from the bushings compartment revealed 10,964 ppm PCBs (DOE 1992).

PAC Investigations

A Sitewide program was initiated in 1991 to identify known, suspect, and potential PCB contaminated sites at the Site. The study was documented in the report titled, Assessment of Known, Suspect and Potential Environmental Releases of PCBs Preliminary Assessment/Site Description (EG&G 1991). This report consisted of document and record reviews, personnel interviews, and field sampling and analysis. These suspect locations became known as PCB sites 1 through 37. PAC 400-800 corresponds with PCB Site 5. The analytical results for its four samples indicated that the PCB levels in the soil surrounding the pad were less than the 25 ppm, total of Aroclors, TSCA guidance for Restricted Access Areas at outdoor electrical substations (DOE 1992). PCBs were not detected in most samples; however, Aroclor-1260 sample results ranged from 0.9 to 1.9 ppm (EG&G 1991).

No Further Action Recommendation

Based on the most recent analytical data, surficial soil in PAC 400-800 indicated the PCB concentrations were less than the 25 ppm level (DOE 1998). Based on the analytical data, PAC 400-800 was proposed as an NFA site in the 1998 Annual Update to the HRR. After review of the Annual HRR Update by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFA for PAC 400-800 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1998, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EG&G, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

PAC REFERENCE NUMBER: 400-801

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-3
Unit Name: Transformer, Roof of Building 447

The Final Update to the HRR for PAC 400-801 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-801 is summarized in this update. The following HRR volumes contain PAC 400-801 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

Unknown to 1987

Historical Summary

A transformer was located on the roof of Building 447. The pad may have had a berm around it at one time. It is believed to have leaked prior to its replacement in 1987. Downspouts were located north of the transformer's former position that would have allowed PCB-contaminated runoff to infiltrate soil adjacent to Building 447. A storm drain was situated roughly 20 ft from the building and may have also been contaminated (DOE 1992). In 1976, roofing material was removed from under the transformer because of possible leaks. Figure 18 illustrates the PAC's current boundaries and its location within the 400 Area.

Originally, the boundaries of the original PAC location were estimated, but were revised based on sample location surveys and field reconnaissance. The boundary change was documented in the 2004 Annual Update to the HRR (DOE 2004).

Smear samples collected in 1987 from the drain valve and adjacent transformer wall indicated 120 and 194 µg/kg of PCBs, respectively (DOE 1992).

PAC Investigations

A Sitewide program was initiated in 1991 to identify known, suspect, and potential PCB contaminated sites at the Site. The study was documented in the report titled, Assessment of Known, Suspect and Potential Environmental Releases of PCBs Preliminary Assessment/Site Description (EG&G 1991). The study consisted of document and record reviews, personnel interviews, and field sampling and analysis. These suspect locations became known as PCB sites 1 through 37. PAC 400-801 corresponds with PCB Site 9. One of the two samples collected from the PCB site was a sediment sample collected from a storm drain sump that was situated roughly 20 ft from Building 447. Analytical results indicated the presence of PCBs at 54,000 µg/kg. This exceeded the WRW soil AL (DOE et al. 2003) of 12,400 µg/kg.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), which included PAC 400-801, accelerated action soil samples were collected at five surface and subsurface locations in 2003. COCs included radionuclides, metals, and PCBs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (2003b). Uranium isotopes were detected at all five surface locations (highest detection was uranium-234 and uranium-238 at 4.86 pCi/g), and metals were detected at one surface location (aluminum, beryllium, chromium and lithium at 33,000, 1.6, 19, and 17 mg/kg, respectively) (DOE 2003b).

The storm drain sump and associated PCB-contaminated sediment were removed as part of the D&D of Building 447 in 2004. After removal, two soil samples were collected at this location and analyzed for PCBs. Results indicated Aroclor-1254 was detected at an estimated concentration of 38 µg/kg and Aroclor-1260 was detected at a concentration of 52 µg/kg. The manhole was filled with 10 to 15 ft of concrete from the bottom of the manhole upwards. The storm drain pipeline under Building 447 remained in place, but both ends were plugged with concrete at the manholes. Building 447 was demolished in December 2004. Included in the demolition was the roof transformer site (DOE 2005a).

No Further Accelerated Action Recommendation

Accelerated action was not necessary and an NFAA determination was justified for IHSS Group 400-3, which included PAC 400-801, because of the following:

- COC concentrations in soil were less than the RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the IHSS was not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS Group 400-3. Groundwater contamination beneath this PAC was considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005b).
- The storm drain sump and associated PCB-contaminated sediment were removed as part of the D&D of Building 447 in 2005 (DOE 2005a).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA status for PAC 400-801 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, August 1, 2003 through October 1, 2004, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Data Summary Report IHSS 000-3 PAC 000-505 Storm Drains, Rocky Flats Environmental Technology Site, Golden, CO, Preparation.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EG&G, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

PAC REFERENCE NUMBER: 400-802

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 600-2
Unit Name: Storage Shed South of Building 334

The Final Update to the HRR for PAC 400-802 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-802 is summarized in this update. The following HRR volumes contain PAC 400-802 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1955 to 1969

Historical Summary

The storage area south of Building 334 was originally a metal or wooden structure built on a concrete slab. A July 1955 aerial photograph indicated the building had been removed and the remaining slab was not being used for storage. Figure 18 illustrates the PAC's current boundaries and its location within the 400 Area.

The first documented usage of the area for storage was reported on October 24, 1955, when 125 barrels of depleted uranium chips immersed in oil were stored there. The drums developed leaks that contaminated the slab. In October 1956, one or two leaking drums contaminated the slab to 537 dpm. As of November 1956, 10 to 20 drums were leaking, and on November 12, 1956, an overturned 30-gallon drum spilled contaminated oil onto the slab (DOE 1992).

Cleanup was attempted in October 1956. The leaking drums were placed in larger drums, and contamination on the concrete slab was reduced from 537 dpm to 108 dpm using perchloroethylene. The drums were moved to the 903 Pad (PAC 900-112), on November 15th and 16th, 1956. The slab where the drums were stored was cleaned on November 28, 1956 (DOE 1992).

It was discovered that contamination had spread to equipment that was also stored in the area. The equipment was moved, but the slab still had smear sample results of up to 10,000 dpm. Additional monitoring conducted in December 1956 revealed that the contamination was spreading because of weather conditions. By January 1957, low-level radioactivity had extended to the fuel storage tank located south of Building 551 (PAC 600-152) (DOE 1992).

Although documentation indicated that the contaminated drums stored south of Building 334 were removed, photographs indicated that the storage of miscellaneous items at this site continued until 1969. No documentation was found that indicated the kinds of materials stored at the site after 1956 or whether the materials were contaminated (DOE 1992).

Although the slab was cleaned where the drums were stored, the area around the contaminated equipment had not been cleaned as of the end of December 1956. The equipment was moved to a production area on Plant site. The loose oxide was removed, and the area covered with plastic to prevent spreading of contamination. Smears up to 9,936 dpm were collected prior to vacuuming. Monitoring conducted on December 20, 1956, showed a maximum of 7,245 dpm on the slab (DOE 1992).

PAC Investigations

Three surface soil samples were collected and analyzed prior to the accelerated action. All contaminant activities and concentrations were below RFCA WRW soil ALs (DOE 2003b; DOE et al. 2003).

Characterization activities were conducted between July 17 and August 21, 2002, in accordance with IASAP Addendum #IA-02-06 (DOE 2002a) and ER RSOP Notification #02-07 (DOE 2002b). The activities involved soil characterization, the removal of the slabs beneath Trailers T452G and T452F and associated asphalt-paved areas. Fifty-four PAC 400-802 characterization samples were collected from surface and subsurface soil and analyzed (DOE 2003b). Radionuclides, metals, PCBs, SVOCs, and VOCs were considered COCs. Analytical results revealed all PCOCs were less than WRW soil ALs. Benzo(a)pyrene was detected in several locations (1,000 and 1,300 µg/kg) at concentrations greater than RFCA surface soil Tier II AL of 614 µg/kg (DOE et al. 1996). Analytical results from the characterization efforts were presented in the Final Closeout Report for IHSS Group 600-2 (DOE 2003b).

Activities involved the removal of the slabs beneath Trailers T452G and T452F and associated asphalt-paved areas. NPWL, OPWL, tanks and sanitary lines were not associated with these trailers or slabs and none were removed (DOE 2003b).

No Further Accelerated Action Recommendation

As shown in the Final Closeout Report (DOE 2003b), analytical results indicated all COCs were less than RFCA WRW soil ALs.

The DOE received approval from CDPHE, the LRA, of NFAA for PAC 400-802 on June 19, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO; from S. Gunderson; CDPHE, RE: Final Data Summary Report [IHSS Group 600-2], June 19.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2002a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-06, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification 02-07, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2003a, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Closeout Report for IHSS Group 600-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-803

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-4
Unit Name: Miscellaneous Dumping, Building 446 Storm Drain

The Final Update to the HRR for PAC 400-803 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-803 is summarized in this update. The following HRR volumes contain PAC 400-803 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

July 1972

Historical Summary

PAC 400-803 consisted of a reported release to the storm drain west of Building 446. A roofing contractor at Building 444 had reportedly dumped miscellaneous materials into the storm drain, which consisted of silver paint, aluminum paint, and possibly other materials including oil. The material flowed along a historic open ditch south of Cottonwood Avenue to a point south of the former fuel oil storage tanks, passed beneath the street, and ran northeast to the extent of Seventh Avenue. The contractor was to have cleaned up the ditch and taken the residue to the landfill (DOE 1992). Figure 18 illustrates the PAC's boundaries and its location within the 400 Area.

PAC Investigations

In accordance with IASAP Addendum #IA-04-14 for IHSS Group 400-4 (DOE 2004b), which included PAC 400-803, six surface and subsurface soil characterization samples were collected and analyzed for radionuclides, metals, and SVOCs. COC concentrations in soil were less than the RFCA WRW soil ALs (DOE et al. 2003) except for benzo(a)pyrene and dibenz(a,h)anthracene. The benzo(a)pyrene concentration in surface soil at sampling location BX37-024 was 9,200 µg/kg, and the AL is 3,490 µg/kg. The benzo(a)pyrene concentration in subsurface soil at sampling location BY37-030 (0.5-2.5 ft bgs) was 3,500 µg/kg, and the dibenz(a,h)anthracene concentration at the same location was 10,000 µg/kg, and the AL is 3,490 µg/kg (DOE 2004c). This storm drain was removed. Its removal is documented in the Data Summary Report for IHSS Group 000-3, PAC 000-505 (Storm Drains) (DOE 2005a).

No Further Accelerated Action Recommendation

Action was not required and an NFAA determination was justified for PAC 400-803, because of the following (DOE 2004c):

- COC concentrations in soil were less than the RFCA WRW soil ALs except for benzo(a)pyrene, at 0 to 0.5 ft and 0.5 to 2.5 ft, and dibenz(a,h)anthracene at 0.5 to 2.5 ft. No action was taken to remove the soil with elevated benzo(a)pyrene and dibenz(a,h)anthracene concentrations because these COCs were not located within an area prone to landslides or erosion. Their concentrations were 9,200, 35,000 and 10,000 µg/kg, respectively. Additionally, these COCs were not detected in surface water or groundwater monitoring stations near the IHSS Group. These COC exceedances appeared to be most likely due to asphaltic materials mixed in with the soil throughout the area. The surface benzo(a)pyrene exceedance was less than three times the AL (DOE 2004c).
- Migration of contaminants to surface water through erosion is unlikely because the exceedances are not in an area prone to landslides or erosion.
- Migration of contaminants to groundwater with subsequent impact to surface water is not likely because of the low levels of soil contamination found at PAC 400-803. Any existing contaminated groundwater in the area is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005b).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA for PAC 400-803 on August 23, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, Re: Approval, Data Summary Report for IHSS Group 400-4, PAC 400-803 – Miscellaneous Dumping, Building 446 Storm Drain, and PAC 400-804 – Road North of Building 460, August 23.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Industrial Area Sampling and Analysis Plan Fiscal Year 2004 Addendum #IA-04-14, IHSS Group 400-4, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, Data Summary Report for IHSS Group 400-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005a, Data Summary Report for IHSS Group 000-3 and PAC 000-505, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June 21.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-804

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-4
Unit Name: Road North of Building 460

The Final Update to the HRR for PAC 400-804 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-804 is summarized in this update. The following HRR volumes contain PAC 400-804 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

June 11, 1957

Historical Summary

On June 11, 1957, a pallet box with four ingots of unknown composition fell from a truck. The road, which was north of Building 446, was damaged. After removal of the ingots, the area was dry-vacuumed and monitored; however, monitoring was discontinued because of rain. Photographs that document the event were located and used to pinpoint the location of the incident (DOE 1992). Figure 18 illustrates the PAC's boundaries and its location within the 400 Area.

The day after the incident, direct counts up to 500 cpm and smears up to 104 dpm were obtained from the damaged area. These areas were covered with asphalt patching material (DOE 1992).

PAC Investigations

In accordance with IASAP Addendum #IA-04-14 for IHSS Group 400-4 (DOE 2004b), which included PAC 400-804, two surface soil characterization samples were collected and analyzed for radionuclides in 2004. PAC 400-804 COC concentrations in soil were less than the RFCA WRW soil ALs (DOE et al. 2003). Uranium-234 and uranium-238 were the highest detected radionuclides at 10.57 pCi/g, respectively. Analytical results from the characterization were presented in the Data Summary Report for IHSS Group 400-4 (DOE 2004c).

No Further Accelerated Action Recommendation

Based on the analytical results and the SSRS, action was not required and an NFAA determination is justified for PAC 400-804, because of the following (DOE 2004c):

- PAC 400-804 COC concentrations in soil were less than the RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the exceedances are not in an area prone to landslides or erosion.

- Migration of contaminants to groundwater with subsequent impact to surface water is not likely because of the low levels of soil contamination found at PAC 400-804. Any existing contaminated groundwater in the area is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA for PAC 400-804 on August 23, 2004 (CDPHE 2004).

Comments

Although PAC 400-804 remains titled, "Road North of Building 460," the incident took place north of Building 446 and not Building 460.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, Re: Approval, Data Summary Report for IHSS Group 400-4, PAC 400-804 – Miscellaneous Dumping, Building 446 Storm Drain, and PAC 400-804 – Road North of Building 460, August 23.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2004a, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Industrial Area Sampling and Analysis Plan Fiscal Year 2004 Addendum #IA-04-14, IHSS Group 400-4, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, Data Summary Report for IHSS Group 400-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-805

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Building 443 Tank #9 Leak

The Final Update to the HRR for PAC 400-805 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-805 is summarized in this update. The following HRR volume contains PAC 400-805 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1990

Historical Summary

While conducting tightness tests on tanks within Rocky Flats, a leak around a filler pipe of Tank #9, a fuel oil tank located near the Steam Plant (Building 443), was detected. Fuel was found around the filler pipe area. Maintenance personnel were to repair the leak by tightening, repairing or replacing the filler pipe. No documentation was found that detailed the fate of constituents to the environment (DOE 1992). Figure 18 illustrates the PAC's boundaries and its location within the 400 Area.

PAC Investigations

During the IHSS Group 400-7 accelerated action, Tank #9, which had previously been foamed, was removed and disposed of as sanitary waste. The soil around the tank and the associated spill area was also removed as a function of the IHSS Group 400-7 action. The removal is documented in the Closeout Report for IHSS Group 400-7 (DOE 2004).

No Further Action Recommendation

On December 5, 2001, DOE provided the FY2002 HRR Working Group a Site location map showing the diesel fuel tank (Tank #9) as being completely separated from the #6 fuel oil tanks (Tanks 1-4) (DOE 2002). As determined by the FY2002 HRR Working Group and in accordance with a February 14, 2002 approval letter from CDPHE, the LRA, PAC 400-805 was approved for NFA (CDPHE and EPA 2002) (DOE 2002) (EPA 1992).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Closeout Report for IHSS Group 400-7, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

EPA, 1992, Correspondence to R. Schassburger, DOE RFO; from M. Hestmark, EPA Region VIII; RE: Potential Area of Concern Needing Further Investigation, December 23.

PAC REFERENCE NUMBER: 400-806

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Catalyst Spill, Building 440

The Final Update to the HRR for PAC 400-806 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-806 is summarized in this update. The following HRR volume contains PAC 400-806 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 21, 1989

Historical Summary

Approximately five gallons of a catalyst leaked from a foam production tank located north of Building 440. The liquid flowed onto the pavement but was stopped before it could enter the storm drain. Figure 18 illustrates the PAC's boundaries and its location with respect to Building 440 and within the 400 Area.

The leak was due to a small crack in the tygon tubing and consisted of polymethylene polyphenylisocyanate which was determined not to be a hazardous material. The liquid was cleaned up with "oil dry" to absorb the spill and the residue was placed in hazardous material waste drums. It was determined that the event was not reportable and precautions were taken to prevent further spills until the leak was repaired (DOE 1992).

PAC Investigations

No further investigation deemed necessary because the spill was on to pavement (EPA 1992).

No Further Action Recommendation

In accordance with a February 14, 2002 approval letter from CDPHE (CDPHE and EPA 2002), the LRA, and EPA, PAC 400-806 was approved for NFA, citing that PAC 400-806 met the criteria for such status as defined in RFCA Attachment 6 (DOE et al. 1996).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1992, Correspondence to R. Schassburger, DOE RFO; from M. Hestmark, EPA Region VIII; RE: Potential Area of Concern Needing Further Investigation, December 23.

PAC REFERENCE NUMBER: 400-807

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-10
Unit Name: Sandblasting Area

The Final Update to the HRR for PAC 400-807 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-807 is summarized in this update. The following HRR volumes contain PAC 400-807 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

May to September 1976

Historical Summary

No documentation could be found that detailed the exact date that sandblasting began in the 400 Area; however, May 1976 references stated that sandblasting of ATMX railcars took place “north of Building 664,” “inside the fence east of 444,” and “east of Building 439.” Figure 18 illustrates PAC 400-807’s location within the 400 Area. More accurately, the actual PAC location is southeast of Building 444, opposed to “east of 444” as commented in the May 1976 reference. In September 1976, Rocky Flats personnel initiated the substitution of alumina grit for flint sand because of its lower toxicity (DOE 1992; 2003a).

PAC Investigations

In accordance with IASAP Addendum #IA-02-01 for IHSS Group 400-10 (DOE 2001), which included PAC 400-807, accelerated action characterization samples were collected and analyzed in 2002. Seven surface soil characterization samples were collected and analyzed. Radionuclides, SVOCs, and metals, specifically aluminum, were considered the PCOCs for PAC 400-807. The analytical results showed no sample results greater than the RFCA WRW soil ALs (DOE et al. 2003), and were documented in the Data Summary Report for IHSS Group 400-10 (DOE 2003b). Uranium isotopes were detected at four locations and metals were detected at five locations. The maximum radionuclide detection was uranium-235 at 0.26 pCi/g and beryllium and chromium were detected at 1.1 and 21.3 mg/kg, respectively.

No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As shown in the Data Summary Report (DOE 2003b), analytical results from the sampling event indicated that all PCOCs were less than RFCA WRW soil ALs.

DOE received approval from CDPHE, the LRA, of the NFAA status for PAC 400-807 on July 15, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO; from S. Gunderson; CDPHE, RE: Final Data Summary Report for IHSS Group 400-10, July 15.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Characterization Data Summary Report for IHSS Group 400-10, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-808

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Vacuum Pump Leak – Building 442

The Final Update to the HRR for PAC 400-808 consolidates the information in the initial 1992 HRR information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-808 is summarized in this update. The following HRR volume contains PAC 400-808 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

March 6, 1991

Historical Summary

A release occurred from a vacuum pump system along the northern side of Building 442 (DOE 1992). Figure 18 illustrates the PAC's boundaries and its location with respect to Building 442 and within the 400 Area.

About one quart of oil contaminated an area roughly 18- by 24-inches beneath the pump. The pump was used to test filter adequacy, a process that involved the use of Di-n-octylphthalate. Initially, it was not known if the oil contained any Di-n-octylphthalate; therefore, soil samples were collected. TCLP analytical results indicated quantities of 1,1-dichloroethane, trichloroethane, toluene, benzene, and chlorobenzene that were greater than the detection limit but were below the regulatory standard. Total analysis indicated the presence of hydrocarbons and a high concentration of bis(2-ethylhexyl)phthalate, which is commonly used in vacuum pump oil. Hydrocarbons were found in trace amounts (DOE 1992).

Repair of the pump was completed on March 6, 1991, and further investigation indicated the vacuum pump may have been pulling Di-n-octylphthalate through the process line. The information was discovered on March 8, 1991 at which time Filter Test Personnel were instructed to cover the area to prevent contaminant migration due to precipitation. Soil samples were collected on March 11, 1991, and cleanup was completed on March 13. Confirmation samples were collected on March 14, 1991 to ensure the complete removal of contamination, and a work order was issued to provide a containment system. The material generated during the cleanup was stored in a RCRA-regulated satellite collection area while waiting analytical results (DOE 1992).

PAC Investigations

No further investigation was deemed necessary (EPA 1992).

No Further Action Recommendation

In accordance with a February 14, 2002 approval letter from CDPHE (CDPHE and EPA 2002), the LRA, and EPA, PAC 400-808 was approved for NFA, citing that PAC 400-808 met the criteria for such status as defined in RFCA Attachment 6 (DOE et al. 1996).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July 19.

EPA, 1992, Correspondence to R. Schassburger, DOE RFO; from M. Hestmark, EPA Region VIII; RE: Potential Area of Concern Needing Further Investigation, December 23.

PAC REFERENCE NUMBER: 400-809

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Oil Leak – 446 Guard Post

The Final Update to the HRR for PAC 400-809 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-809 is summarized in this update. The following HRR volume contains PAC 400-809 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 26, 1991

Historical Summary

A release of motor oil occurred in the motorcycle parking lot north of the 446 Guard Post. No motorcycles were present in the parking lot when the spill was discovered. Figure 18 illustrates the PAC's boundaries and its location with respect to the 446 Guard Post and within the 400 Area.

The HAZMAT team responded to the spill. The spill consisted of 1 quart of motor oil and the contaminated soil was cleaned up with absorbent material. Approximately 1 ft³ of contaminated material was generated during the cleanup (DOE 1992).

RCRA CPIR No. 91-015 was submitted to the CDH as required (DOE 1992). The RCRA CPIR states that there did not appear to be any threat to the environment. Material was packaged and marked according to RCRA regulatory requirements and transferred to a 90-day accumulation area (DOE 1992).

PAC Investigations

No further investigation was required because the spill was small and the spill was cleaned up. necessary.

No Further Action Recommendation

CDPHE, the LRA, and EPA formally approved the PAC 400-809 NFA determination (CDPHE and EPA 2002), citing that PAC 400-809 met the criteria for such status as defined in RFCA Attachment 6 (DOE et al. 1996).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO; from S. Gunderson, CDPHE; T. Rehder, EPA Region VIII; RE: Approval of NFA Designation for IHSSs & PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 400-810

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-3
Unit Name: Beryllium Fire – Building 444

The Final Update to the HRR for PAC 400-810 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 400-810 is summarized in this update. The following HRR volumes contain PAC 400-810 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

February 23, 1978

Historical Summary

While welding on a small inlet duct of the beryllium air plenum that serves Building 444, an employee noticed a fire on the face of the prefilters. The Fire Department was responded to the automatic filter alarm, and in approximately 15 minutes, the fire was extinguished. A third alarm was activated by a worker when smoke backed up into Room 107, which was cancelled when the exhaust fan automatically shut down when the filter fire detection equipment was activated resulting in a negative pressure inside the building (DOE 1992). Figure 18 illustrates PAC 400-810's location within the 400 Area.

Firemen responded to the fire by initially spraying the outside of the plenum where the paint had blistered. One team was able to extinguish the fire from inside the plenum. A fog nozzle was used, which was thought to have "washed" any airborne particulate from the air. Other areas around Building 444 were also sprayed down to control contamination. The roadway south of Building 444, where the fire water had flowed, was vacuumed and monitored for beryllium. All smears were determined to have background levels (DOE 1992).

Beryllium levels in the fire water collected from the impounded ditches east and south of Building 444 were 1.6 and 4.3 mg/L, respectively. Analytical results from samples collected from Ponds A-3, B-3, and C-1, and the shower water impounded at Building 881, where employees were bussed to take showers, indicated concentrations of beryllium less than 0.5 mg/L (DOE 1992). Water from the ditches adjacent to Building 444 was transferred to Building 774 for processing, and shower water from Building 881 was impounded at the building's south holding basin (PAC SE-1601) (DOE 1992).

Analytical results indicated 14.5 g of beryllium were released to the atmosphere. At the time, this exceeded the EPA limit of 10 g. Air sampling stations indicated beryllium concentrations ranging from 0.009 to 0.021 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). At the time of this incident, the Occupational Safety and Health Administration (OSHA) standard 8-hour time-weighted

average was $2.0 \mu\text{g}/\text{m}^3$. Because of prevailing wind conditions at the time of the fire, samples collected along Highway 93 contained concentrations of 0.006 to $0.015 \mu\text{g}/\text{m}^3$, which was compared to the EPA standard of $0.01 \mu\text{g}/\text{m}^3$ continuous exposure to the general public. Exposure time would have been only one half hour (DOE 1992).

Stack emissions were monitored for uranium during the fire. Total long-lived alpha was found to be 0.08 pCi/L and total uranium was 0.092 pCi/L . Total Rocky Flats stack emissions for February 1977 were $2.3 \mu\text{Ci}$ (DOE 1992).

PAC Investigations

During 1993, nine surface soil samples were collected within the PAC. All contaminant activities and concentrations were less than the proposed RFCA WRW soil ALs (DOE et al. 2003; DOE 2003a). Radionuclides were detected at activities greater than background means plus two standard deviations.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003a), which included PAC 400-810, accelerated action soil samples were collected at 14 surface and subsurface locations in 2003. PCOCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (2003b) (DOE et al. 2003). Uranium isotopes, metals, and VOCs were detected above background means plus two standard deviations or reporting limits at both surface and subsurface locations. Beryllium was detected at seven surface locations and five subsurface locations (maximum concentration detected was 3.3 mg/kg) (DOE 2003b).

Building 444 was demolished in April 2005 including the beryllium air plenum (DOE 2005a).

No Further Accelerated Action Recommendation

Action was not required and a NFAA determination was justified for PAC 400-810, because of the following:

- PCOC concentrations in soil were less than the wildlife RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because the IHSS was not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS Group 400-3. The groundwater contamination beneath this area is considered part of the IA Plume, which was evaluated in the Groundwater IM/IRA (DOE 2005b).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA for PAC 400-810 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO; from S. Gunderson; CDPHE, RE: Approval, Data Summary Report, IHSS Group 400-3 (Building 444, 447 et al.), December 18.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update to the Historical Release Report, August 1, 2003 through October 1, 2004, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June 21.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-811

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer 443-2, Building 443

The Final Update to the HRR for PAC 400-811 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-811 is summarized in this update. The following HRR volumes contain PAC 400-811 information:

Original Report – Second Quarterly (DOE 1993);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

Unknown

Historical Summary

Transformer 443-2 was located near the southwestern corner of Building 443. The area was surrounded by a concrete berm and restricted by a fence. The transformer was observed leaking small quantities of oil during a routine inspection in April of 1992. Figure 18 illustrates PAC 400-811's location with respect to Building 443 and the rest of the 400 Area.

This site was not originally sampled as part of the sitewide screening effort to categorize the 35 suspected PCB sites in August of 1991 (EG&G 1991). However, the surrounding soil was sampled in the same manner as the other sites in September of 1991 (DOE 1992).

Analytical data showed PCB concentrations present in soil surrounding the transformer as high as 230 ppm. Radiological samples collected at the same time were analyzed and indicated background levels for plutonium-239/240, uranium-233/234, uranium-235, uranium-238, and americium-241. Wipe samples collected from the outside of the transformer in April 1992 indicated the dielectric oil contained 2,000 micrograms per 100 square centimeters ($\mu\text{g}/100^2\text{cm}$) PCBs. Oil samples analyzed in April 1992 showed that the oil contained 12,000 ppm PCBs (DOE 1992).

The transformer was taken out of service in April 1992. The transformer, oil, and concrete pad cleanup actions were conducted in accordance with TSCA regulations (DOE 1992).

PAC Investigations

Five samples were collected to verify a successful cleanup. The results indicated the PCB levels in the soil were less than the 25 ppm (total) TSCA guidance for Restricted Access Areas at outdoor electrical substations. Most analytes were not detected. Aroclor-1248 was detected between 0.029 and 3.6 ppm. The transformer, oil, concrete berm, and concrete pad had all been removed before Building 443's demolition (June 20, 2004).

No Further Action Recommendation

Because the analytical data for the soil in PAC 400-811 indicated the PCB concentrations were less than 25 ppm; this site was proposed as NFA in the 1998 Annual Update to the HRR (DOE 1998). After review of the Annual HRR Update by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFA for PAC 400-811 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1993a, Second Quarterly Update, October 1, 1992 to January 1, 1993, Historical Release Report (HRR), Rocky Flats Plant, Golden, Colorado, January.

DOE, 1998, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EG&G, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

PAC REFERENCE NUMBER: 400-812

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Tank T-2 Spill in Building 460

The Final Update to the HRR for PAC 400-812 consolidates the information in the Sixth Quarterly Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-812 is summarized in this update. The following HRR volumes contain PAC 400-812 information:

- Original Report – Sixth Quarterly (DOE 1994a);
- Update Report – Seventh Quarterly (DOE 1994b);
- Update Report – Eighth Quarterly (DOE 1994c);
- Update Report – 2001 Annual (DOE 2001); and
- Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

November 10, 1993

Historical Summary

A release of process water occurred on November 10, 1993, when personnel were transferring 3,500 gallons of process waste water from Tank T-2 (RCRA Unit 40.09) located inside Building 460 to a tanker truck. Approximately 90 minutes into the transfer operation, an employee observed liquid escaping from an air vent on top of the tanker (DOE 1994a). Employees involved in the transfer operation immediately shut down the pumps from Building 460 and secured the discharge valves from Tank T-2 to prevent additional waste from entering the tanker truck. Figure 18 illustrates PAC 400-812's location with respect to Building 460 and the rest of the 400 Area.

Approximately 25 gallons of liquid were released onto the soil and concrete dock area (northwestern corner of Building 460). The dock area consisted of approximately 3 inches of soil covering a concrete sub-slab (DOE 2001). The 25 gallons of material released to the soil and underlying concrete was characterized as potentially containing a characteristic chromium hazardous waste. Based on field pH test, the released liquid had a pH range of 6.0 to 6.5. Analytical results indicated RCRA waste characteristics for toxicity were not exceeded.

The RCRA Contingency Plan was implemented, and CDPHE and EPA were notified of the event. Samples of the spilled liquid and wetted soil were collected from under the tanker. Absorbent socks and a wet vacuum were used to remove standing liquids. Approximately 12 gallons of the spilled liquid were recovered and returned to Tank T-2. The used absorbent socks and personal protective equipment (PPE) were placed in the Building 460 RCRA 90-day accumulation area. On November 11, 1993, the soil overlying the concrete subslab was removed (eight 55-gallon drums) and transferred to a RCRA permitted storage area.

It was determined that a release of potentially hazardous constituents to the environment was unlikely due to the response action and concrete sub-slab design (DOE 2001).

PAC Investigations

On November 3, 2000, eight 1-ft composite soil samples were collected at PAC 400-812. PCOCs were identified as VOCs, total metals, pH, and gross alpha-beta. VOCs were collected by grab methods, and all sampled locations were surveyed. Analytical results indicated no PCOC detections for PAC 400-812 (DOE 2001).

RCRA Unit 40.09, including the tank, was closed in accordance with the RCRA Closure Plan for the B460 Process Waste System (10/19/95), and the Closure Certification was signed on September 16, 1996 (DOE 2005).

No Further Action Recommendation

Based upon the analytical results and the spill cleanup, no current or potential contaminant source could be identified. PCOCs for PAC 400-812 were not detected and this PAC was proposed for NFA in the Eighth Quarterly Update (DOE 1994c) and 2001 Annual Update to the HRR (DOE 2001).

After review of the HRR Updates and the data by the regulatory agencies, DOE received approval from CDPHE, the LRA, and EPA, of the NFA status for PAC 400-812 on February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1994a, Sixth Quarterly Update to the Historical Release Report, October 1, 1993 through January 1, 1994, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1994b, Seventh Quarterly Update to the Historical Release Report, January 1, 1994 through March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994c, Eighth Quarterly Update to the Historical Release Report, April 1, 1994 through June 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2001, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Rocky Flats Environmental Technology Site Type 1 Reconnaissance Level Characterization Report (RLCR) – Building 460 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, April 20.

PAC REFERENCE NUMBER: 400-813

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-5
Unit Name: RCRA Tank Leak in Building 460

The Final Update to the HRR for PAC 400-813 consolidates the information in the Seventh (7th) Quarterly Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-813 is summarized in this update. The following HRR volume contains PAC 400-813 information:

Original Report – Seventh Quarterly (DOE 1994).

Date(s) of Operation or Occurrence

January 12, 1994

Historical Summary

During a routine daily inspection, approximately 2 gallons of liquid was found in the secondary containment piping associated with a RCRA-regulated process aqueous waste collection tank (RCRA Unit 40.12) in Building 460. The release originated from the gravity drain piping between a process sink and sump tank ST-2 (the ancillary equipment associated with the RCRA Unit). The affected piping was located under the concrete floor in Room 151 in the approximate center of Building 460, near the Non-Destructive Testing Lab. The secondary containment system for the affected area consisted of a pipe within a pipe (DOE 1994). Figure 18 illustrates the location of PAC 400-813.

The RCRA Contingency Plan was implemented and the liquid in the secondary containment was removed and placed into the process waste system on January 12, 1994. An engineering evaluation was conducted to identify the leaks in primary and secondary containment. The piping was taken out of service on January 12, 1994, and a decision was made not to repair the piping until further evaluation was completed. The pipes were temporarily capped to prevent inadvertent use of the system and alternate means of collection were used for the processes that relied on the capped lines. Waste was collected in drums with secondary containment and then transferred to the Building 460 hazardous waste collection system for disposition (DOE 1994).

An engineering evaluation of the integrity of the secondary containment system was conducted to determine whether there may have been a pathway for contaminants to spread to the environment. Based on the results of the preliminary testing conducted on January 17, 1994, it was determined that there was a possibility that some of the waste may have been released to the environment underneath the floor of Building 460 by passing through the concrete floor and into the soil. Further evaluation on February 1 and 9, 1994, identified a breach in the secondary containment approximately 2.5 ft from the end of the pipe (DOE 1994).

The breach was approximately ¼ inch by ½ inch in area and was located in the vicinity of a sleeve that joined two sections of pipe. The released liquid contained levels of cadmium and

silver that made the material a characteristic hazardous waste. No previous record of leaks from the primary piping is known and very little material was believed to have been released to the environment. The waste was presumed to be confined in the soil in the immediate area of the breach in the secondary containment piping (DOE 1994).

It is unlikely that the release leached into the groundwater because the area of the release was protected against percolation by rain and snowmelt and was located approximately 13.7 ft above the highest recorded level of groundwater in that area of the Plant (DOE 1994).

PAC Investigations

Accelerated action characterization activities were conducted at IHSS Group 400-5, which included PAC 400-813. Characterization activities were conducted in accordance with IASAP Addendum #IA-03-14 (DOE 2003).

Based on PAC 400-813 site history and historical soil sampling results, radionuclides, metals, SVOCs, and VOCs were identified as COCs. One surface and subsurface soil sample was collected and analyzed for the COCs during PAC 400-813 characterization activities in 2003. Analytical results revealed all COCs were less than RFCA WRW soil ALs (DOE et al. 2003). Uranium-235 (0.121 pCi/g), metals (copper and strontium at 65 and 96 mg/kg, respectively), VOCs, and SVOCs were detected. The accelerated action characterization activities conducted at IHSS Group 400-5 and the complete rationale for a NFAA decision at PAC 400-813 are discussed in detail in the Data Summary Report for IHSS Group 400-5 (DOE 2004).

RCRA Unit 40.12, including the tank, was closed in accordance with the RCRA Closure Plan for the B460 Process Waste System (10/19/95), and the Closure Certification was signed on September 16, 1996 (DOE 2005).

No Further Accelerated Action Recommendation

NFAA was recommended for PAC 400-813 based on the following (DOE 2004):

- Activities and concentrations of COCs were all less than the RFCA WRW soil ALs.
- Migration of soil contaminants to surface water is unlikely because COC concentrations are low and PAC 400-813 is not located in an area of high erosion, based on RFCA Attachment 5, Figure 1 (DOE et al. 2003).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA for PAC 400-813 on December 7, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 400-5, IHSS 400-205 – Sump #3 Acid Site, PAC 400-813 and PAC 400-815 – Tank Leaks in Building 460 & Status of RCRA Unit 8, December 7.

DOE, 1994, Seventh Quarterly Update to the Historical Release Report, January 1, 1994 through March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-14, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004, Data Summary Report for IHSS Group 400-5, IHSS 400-205, PAC 400-813, and PAC 400-815, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005, Rocky Flats Environmental Technology Site Type 1 Reconnaissance Level Characterization Report (RLCR) – Building 460 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-814

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Air Conditioner Compressor Release, Building 444 Roof

The Final Update to the HRR for PAC 400-814 consolidates the information in the Eighth (8th) Quarterly Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-814 is summarized in this update. The following HRR volume contains PAC 400-814 information:

Original Report – Eighth Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

May 17, 1994

Historical Summary

At approximately 12:00 p.m. on May 17, 1994, a Rocky Flats Stationary Operating Engineer (SOE) noticed the presence of oil under an air conditioning unit on the roof of Building 444. Upon further investigation of the compressor cabinet unit, the SOE found additional oil. The total volume detected totaled approximately 2 gallons. Based on results from laboratory samples previously taken from other air conditioning equipment, this oil was suspected to be contaminated with levels of cadmium and lead above TCLP regulatory limits (DOE 1994). Figure 18 illustrates PAC 400-814's location with respect to Building 444's roof and the rest of the 400 Area.

The source of the leak was determined to be a hole in a copper line to a pressure control device. The hole was at a point where another copper line crossed at a 90 degree angle directly on top of the lower line. The hole apparently was due to abrasion from vibration between the two lines. Repairs to the unit were made. Approximately 2 gallons of compressor oil and an undetermined amount of Freon 22 were released to the roof of Building 444. Analytical results from a sample of the refrigerant compressor oil released to the roof indicate that the released material was not a hazardous waste (DOE 1994).

The RCRA Contingency Plan was implemented as a precaution. The released oil was cleaned up by removing loose gravel, applying 200 lbs of Oil-Dri[®] absorbent material to the area of release (twice), and sweeping up the absorbent material. The cleanup material was placed in 55-gallon drums and then placed in RCRA 90-day Accumulation Area #442414. The drums were managed as hazardous waste until it was determined that the waste was nonhazardous. The roof was periodically inspected after the cleanup to verify the adequacy of the repairs (DOE 1994).

Building 444 was dispositioned and demolished in April 2005. As a result of the building demolition, the air conditioner compressor site on the roof of Building 444 was demolished (DOE 2005).

PAC Investigations

No other investigation was required because the release was not to soil.

No Further Action Recommendation

Based upon the analytical results and knowledge of the spill cleanup, no current or potential contaminant source could be identified. PAC 400-814 was declared nonhazardous and this PAC was proposed for NFA in the Eighth Quarterly Update to the HRR (DOE 1994).

After review of the Eighth Quarterly Update to the HRR and the data by the regulatory agencies, DOE received approval from CDPHE, the LRA, and EPA, of the NFA status for PAC 400-814 on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, Eighth Quarterly Update to the Historical Release Report, April 1, 1994 through June 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 400-815

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 400-5
Unit Name: RCRA Tank Leak in Building 460

The Final Update to the HRR for PAC 400-815 consolidates the information in the Eighth Quarterly Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-815 is summarized in this update. The following HRR volume contains PAC 400-815 information:

Original Report – Eighth Quarterly (DOE 1994): and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

June 29, 1994

Historical Summary

At 3:05 p.m. on June 29, 1994, a maintenance person discovered a release of approximately 1,800 gallons of process waste water into the secondary containment pit of Sump Tank ST-5 (RCRA Unit 40.15) located in Room 140 of Building 460. Initial surveillance indicated the Hypalon liner in the pit leaked, filling the associated leak-detection sight tube 3/4 full of hazardous process waste water. In addition, approximately 1/2 to 3/4 inches of water was present in the surrounding berm. No leaking had been observed during the RCRA custodian's inspection on the previous day, June 28, at 9:30 a.m. (DOE 1994). Figure 18 illustrates PAC 400-815's location with respect to Building 460 and the rest of the 400 Area.

The RCRA Contingency Plan was implemented as a precautionary measure due to the possibility of a release of hazardous waste from secondary containment to the soil beneath the building. Measurements of the pit were taken which indicated that the total quantity released was approximately 1,800 gallons (DOE 1994).

In response to the spill, cessation of all process waste activities in Building 460 occurred by 4:00 p.m. on June 29, 1994, approximately 1 hour after the leak was detected. Building 460 Maintenance pumped the tank, pit and bermed area of as much water as possible and then vacuumed the remaining waste. This water was collected in RCRA collection Tanks T-1 and T-2 in Building 460. The final removal of all liquid from under the liner was completed by noon on June 30, 1994 (DOE 1994).

Sump Tank ST-5 collected Building 460 process waste water which was initially collected in Tank T-3 and then pumped to a roll filter table that filtered the process waste water prior to collection in Sump Tank ST-5. Sump Tank ST-5 waters were then pumped to collection Tank T-1. These tanks, as well as collection Tank T-2, were all contained within a concrete berm. The concrete was coated with epoxy with the exception of Pit #5 surrounding Sump Tank ST-5, which was lined with a two-ply continuous 0.036 ml thick Hypalon liner with glued seams. The

sight tube associated with this pit was a 12-inch-diameter piece of plastic pipe located in the northwestern corner of the pit. It was slightly offset from the concrete floor to allow collection of any liquid beneath the liner and to serve as a leak detection device for a breach of secondary containment. On June 30, 1994, maintenance tested the hypalon liner in the pit for leakage. Three small areas in the liner indicated leakage paths. The liner was also visually inspected and two additional small areas were found near the top of the pit where the liner had separated (DOE 1994).

Initially, the released material was believed to be nonhazardous based on process knowledge of the production cleaning area activities ongoing at the time and analytical information on the cleaning processes. However, based on analytical sample results, it was later determined that the spilled material was hazardous waste. Samples of the waste water inside and outside the pit liner were collected at 5:00 p.m. on June 29, 1994. Additional samples were collected from the roll filter tank and Tank #3 on the following morning (DOE 1994).

The analytical data indicated cadmium exceeded the TCLP limit in both the pit and the sight tube. Based on the analytical data, no other RCRA metals exceeded TCLP limits or exhibited the characteristic of corrosivity. The source of the cadmium was believed to be from residual Non-Destructive Testing film developer process waste which was last placed into the process waste system on June, 28, 1994. The developer waste water drained to the tank in Pit #2. Because Sump Tank ST-2 pumping was automatic, it is unknown when the solution from this tank was transferred to Tank T-3 (DOE 1994).

It was unknown whether pathways to the environment existed such as cracks or gaps in the containment pit. RCRA Unit 40.15, including the tank, was closed in accordance with the RCRA Closure Plan for the B460 Process Waste System (10/19/95), and the Closure Certification was signed on September 16, 1996 (DOE 2005).

PAC Investigations

Accelerated action characterization activities were conducted at IHSS Group 400-5, which included PAC 400-815, in accordance with IASAP Addendum #IA-03-14 (DOE 2003).

Based on PAC 400-815 site history, radionuclides, metals, SVOCs, and VOCs were identified as PCOCs. One surface and subsurface soil sample was collected and analyzed for the COCs during PAC 400-815 characterization activities. Analytical results revealed no detections of PCOCs. The accelerated action characterization activities conducted at PAC 400-815 are discussed in detail in the Data Summary Report for IHSS Group 400-5 (DOE 2004).

No Further Accelerated Action Recommendation

NFAA was recommended for PAC 400-815 based on the following (DOE 2004):

- Activities and concentrations of PCOCs were not detected; therefore they were uniformly below the RFCA WRW soil ALs (DOE et al. 2003).
- Migration of soil contaminants to surface water is unlikely because little contamination is present and PAC 400-815 is not located in an area of high erosion, based on RFCA Attachment 5, Figure 1 (DOE et al. 2003).

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE, the LRA, of the NFAA for PAC 400-815 on December 7, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 400-5, IHSS 400-205 – Sump #3 Acid Site, PAC 400-815 and PAC 400-815 – Tank Leaks in Building 460 & Status of RCRA Unit 8, December 7.

DOE, 1994, Eighth Quarterly Update to the Historical Release Report, April 1, 1994 through June 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-14, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004, Data Summary Report for IHSS Group 400-5, IHSS 400-205, PAC 400-815, and PAC 400-815, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005, Rocky Flats Environmental Technology Site Type 1 Reconnaissance Level Characterization Report (RLCR) – Building 460 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, April 20.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 400-820

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Central Avenue Ditch Soil Spreading

The Final Update to the HRR for PAC 400-820 can be found under PAC 600-1004. This PAC was re-numbered as PAC 600-1004 in the 7th Quarterly Update to better reflect its mapped location in the 600 Area (DOE 1994). PAC 600-1004 consolidates the information in the Sixth Quarterly Update to the HRR and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 400-820 is not summarized in this update.

Original Report – Sixth Quarterly (DOE 1994a);
Update Report – Seventh Quarterly (DOE 1994).

Date(s) of Operation or Occurrence

Not Applicable

Historical Summary

Not Applicable

PAC Investigations

Not Applicable

No Further Accelerated Action Recommendation

Not Applicable

Comments

This PAC was renumbered as PAC 600-1004 in the Seventh Quarterly Update to the HRR (DOE 1994).









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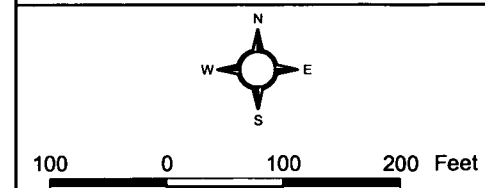
DOE, 1994a, Sixth Quarterly Update to the Historical Release Report, October 1, 1993 through January 1, 1994, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1994b, Seventh Quarterly Update to the Historical Release Report, January 1, 1994 through March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

Figure 19
HRR 500 Area
IHSSs and PACs

KEY

-  Stream
-  Dirt road
-  PAC
-  IHSS
-  HRR area
-  Lake
-  Asphalt
-  Building



Scale = 1: 2350

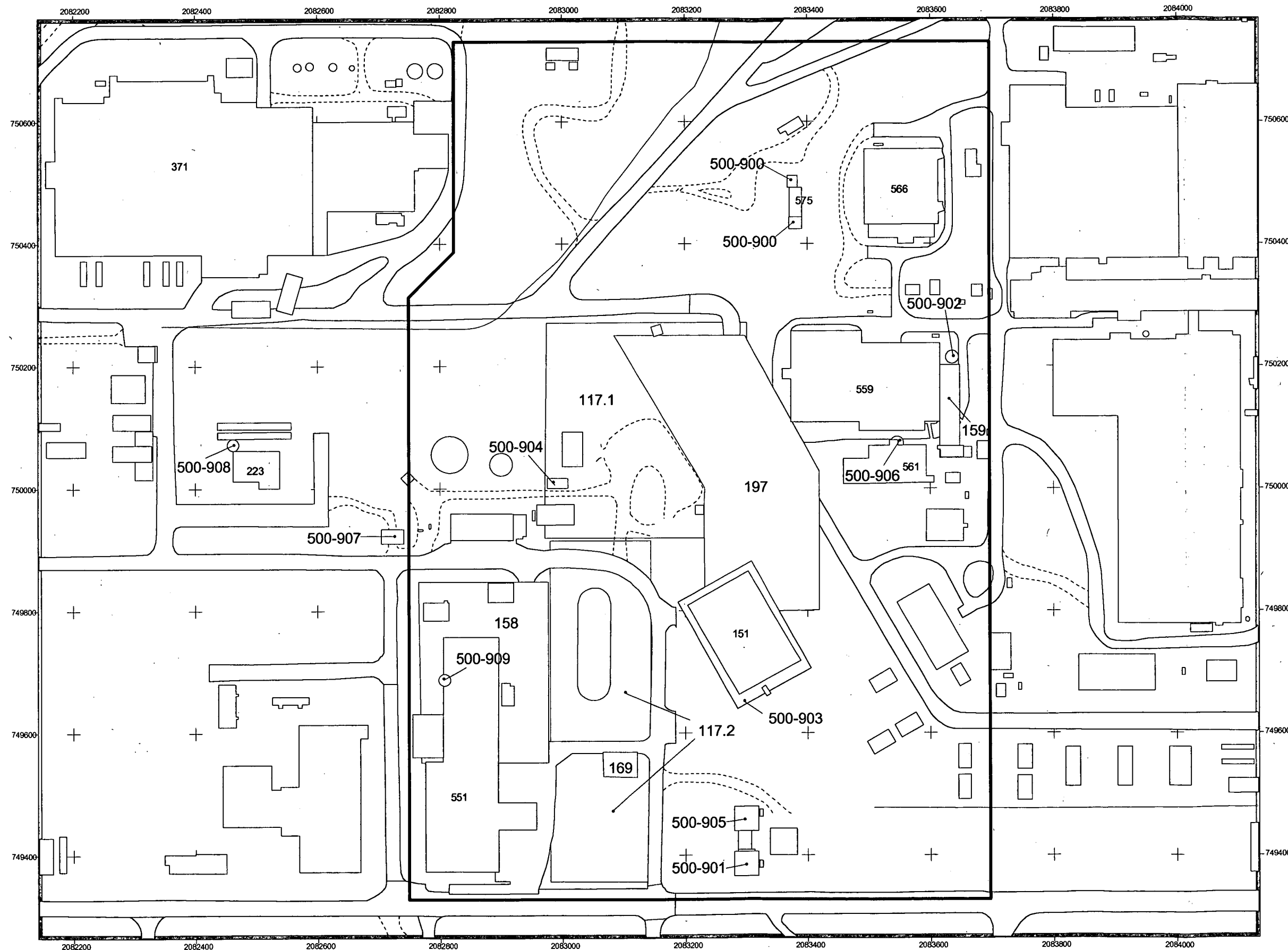
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Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 09.28.05



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PAC REFERENCE NUMBER: 500-117.1

IHSS Number: 117.1
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 500-1
Unit Name: North Site Chemical Storage

This Final Update to the HRR for PAC 500-117.1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 117.1 is summarized in this update. The following HRR volumes contain IHSS 117.1 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to September 1959 to Early 1970s

Historical Summary

As shown on Figure 19, IHSS 117.1 was an approximately 2.6-acre storage area located northeast of Building 551 and west of Building 559. The area was used as a general warehouse storage yard beginning prior to September 1959 and continuing until the early 1970s. A number of incidents are reported in the 1992 HRR (DOE 1992):

- In September 1959, 20 mrem/hr was measured in a 1-ft² area during routine monitoring of the aluminum scrap pile near Building 551; records do not specify the type of radiation detected or the suspected source.
- In May 1963, uranium chips and turnings were discovered in an aluminum scrap pile located at IHSS 117.1.
- In May 1964, 40 drums of aluminum scrap contaminated with uranium chips and turnings were discovered in the storage yard. The material was dumped into the acid waste in SEP Pond 207A (PAC 000-101) (DOE 1992).

In the early 1970s, the material in the general warehouse storage yard was transferred to the PU&D storage yard southwest of the Present Landfill (PAC NW-170) (DOE 1992).

IHSS Investigations

IHSS 117.1 was investigated as part of OU 13 in accordance with the Phase I RFI/RI Work Plan for OU13 100 Area (DOE 1992b). PAC 500-197, originally considered part of OU 16, was transferred to OU 13 and was investigated in conjunction with IHSS 117.1. There is significant overlap in the areas of these two IHSSs and both have histories of scrap metal storage.

OU 13 RFI/RI (DOE 1995) characterization activities at IHSS 117.1 included surface soil sampling, soil gas sampling, and an in-situ HPGe detection survey.

Surface soil samples were collected at 14 locations in IHSS 117.1 and were analyzed for metals, radionuclides, and VOCs. A total of 31 analytes were detected in the samples including five metals (copper, lead, selenium, silver, zinc) that were detected at concentrations exceeding background levels. Maximum detected uranium activities in IHSS 117.1 were 0.55 pCi/g for uranium-233/234 and 0.5 pCi/g for uranium-238. These values are below the background mean plus two standard deviations. Uranium-235 was not detected. None of the sample results for metals, radionuclides, or VOCs exceeded the applicable PPRGs (DOE 1994).

OU 13 RFI/RI soil gas sampling in IHSS 117.1 included 99 initial screening samples and 5 follow-up samples. Chlorinated solvents were detected in the central portion of IHSS 117.1. Maximum detected concentrations in IHSS 117.1 soil gas include tetrachloroethene at 2,200 µg/L, carbon tetrachloride at 930 µg/L, trichlorofluoromethane at 47 µg/L, and trichloroethylene at 19 µg/L. This may be associated with the storage of scrap metal and machine turnings in this area, as chlorinated solvents are commonly used as degreasers. BTEX (fuel-related aromatic hydrocarbon) compounds were detected along the southern boundary of the IHSS, which is expected because this area borders a major street. Maximum detected concentrations included toluene at 10 µg/L, benzene at 3.4 µg/L, and xylenes at 3.43 µg/L. Ethylbenzene was not detected at a concentration greater than 1 µg/L.

The in-situ HPGe survey was conducted using a truck-mounted HPGe gamma radiation detector with a nominal detection radius of 147.5 ft. Using this system, survey results may be elevated due to the presence of buildings that process or store radionuclides within the radius of detection, a phenomenon known as "shine." In-situ HPGe survey data were considered as qualitative and were intended to be used in conjunction with other data, particularly laboratory analyses of soil samples, for characterizing the nature and extent of radionuclide contamination in soil.

HPGe results from IHSS 117.1 and the surrounding area indicated an area of elevated americium-241 specific activity occurring east of IHSS 117.1 and west of Building 707, centered north of Building 569. Approximate activities decrease from over 100 pCi/g in this area to less than 1 pCi/g in the northwestern portion of IHSS 117.1. Specific activities within IHSS 117.1 were in the 0.1 to 10 pCi/g range (DOE 1995). The elevated readings detected east of IHSS 117.1 were attributed to shine from Building 569. IHSSs 123.2, 150.5, and 162 overlap the area where elevated americium-241 activities were recorded. These areas were characterized in accordance with IASAP Addendum #IA-03-11 (DOE 2003a) and no remediation was required under RFCA (DOE et al. 1996).

RFCA (DOE et al. 1996) accelerated action activities were conducted at IHSS 117.1 as part of IHSS Group 500-1 in accordance with IASAP Addendum #IA-04-03 (DOE 2003b). A total of 33 surface soil and 272 subsurface soil samples were collected from 103 statistical and 2 biased sampling locations in 2003. Radionuclides, metals, PCBs, dioxins, furans, and VOCs were identified as COCs. None of the COCs was detected at levels exceeding the RFCA WRW soil AL (DOE et al. 2003) in either surface (0 to 0.5 ft bgs) or subsurface (0.5 to 14.5 ft bgs) soil samples (DOE 2004b). Uranium-234, uranium-235, and uranium-238 were detected in surface (0 to 0.5 ft bgs) soil at activities slightly exceeding background but well below RFCA WRW soil ALs. In subsurface soil, uranium isotopes were present within background levels. Based on the results of accelerated action sampling, no remediation was required under RFCA (DOE 2004b).

No Further Accelerated Action Recommendation

NFAA was recommended for IHSS 117.1 based on the following:

- Contaminant concentrations and activities in surface and subsurface soil were less than RFCA WRW soil ALs (DOE 2004b).
- The SSRS as presented in the IHSS Group 500-1 Data Summary (DOE 2004b)

After a review of the IHSS Group 500-1 Data Summary Report (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of NFAA status for IHSS 117.1 on September 29, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 500-1, IHSS 300-186, IHSS 500-117.1, and IHSS 500-197, September 29.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 13 100 Area, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1994, Programmatic Risk-Based Preliminary Remediation Goals for the Rocky Flats Environmental Technology Site, Final, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Data Summary 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003b, Industrial Area Sampling and Analysis Plan Addendum #IA-04-03, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004a, Annual Update for the Historical Release Report. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 500-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-117.2

IHSS Number: 117.2
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 500-4
Unit Name: Middle Site Chemical Storage

This Final Update to the HRR for PAC 500-117.2 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 117.2 is summarized in this update. The following HRR volumes contain IHSS 117.2 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to 1971 to Prior to September 1988

Historical Summary

IHSS 117.2 was an approximately 2.1-acre chemical storage area east of Building 551. Minor leaks and spills occurred at IHSS 117.2, including acids, oils, soaps, solvents, and beryllium scrap metal. The location of IHSS 117.2 is shown on Figure 19. An inspection in approximately 1971 revealed several drums which were leaking an oily substance. On October 20, 1986, a 55-gallon drum of aluminum nitrate ($\text{Al}[\text{NO}_3]_3$) was punctured by a forklift east of Building 551. Most of the 55 gallons flowed out and across the roadway to the east (Seventh Street). The October 20, 1986, incident was reportedly controlled with no environmental damage (DOE 1992).

In the early 1970s, there was a recommendation made for the repacking of leaking drums in the storage area. IHSS 117.2 was paved with asphalt sometime during the 1970s (DOE 1992).

IHSS Investigations

IHSS 117.2 was investigated as part of the OU13 RFI/RI in accordance with the Phase I RFI/RI Work Plan for OU 13 100 Area (DOE 1992b). Investigative activities took place between 1992 and 1995 and included vertical soil profiling, surface soil sampling, basefill sampling, a soil gas survey, asphalt sampling, and an HPGe survey.

Vertical soil profiling at IHSS 117.2 showed that americium-241, plutonium-239/240, and uranium-235 activities were not elevated above minimum detectable activities at any depth. Eleven surface soil samples were collected in IHSS 117.2 and analyzed for metals, radionuclides, and organics. Of the 38 analytes detected in these surface soil samples, 25 were metals and 13 were radionuclides. Analytes exceeding background included chromium up to 34.2 mg/kg, cobalt up to 13 mg/kg, lead up to 62.8 mg/kg, nickel up to 28 mg/kg, zinc up to 1497 mg/kg, americium-241 up to 0.169 pCi/g, plutonium 239/240 up to 0.225 pCi/g, and radium-226 up to 1.775 pCi/g (DOE 1995).

Basefill was sampled at two surface soil sampling locations in IHSS 117.2 where basefill was observed overlying native surface soil. Basefill samples were analyzed for metals and radionuclides, none of which were detected above background levels (DOE 1995).

Soil gas sampling was conducted on a grid with 20-ft spacing, resulting in 144 soil gas samples collected in IHSS 117.2. BTEX (fuel-related aromatic hydrocarbon) compounds were detected in the northern and south-central portions of IHSS 117.2, and chlorinated solvents were detected in the northern and southern portions of the IHSS. Based on the history of the IHSS and the geographical distribution of the detections, both the BTEX and the chlorinated solvents in the southern area appeared to be associated with the storage of machining waste. Asphalt was sampled at two locations in the northern half of IHSS 117.2, and was analyzed for metals and radionuclides. No analytes were detected above background (DOE 1995).

The in-situ HPGe survey was conducted using a truck-mounted HPGe gamma radiation detector with a nominal detection radius of 147.5 ft. Using this system, survey results may be elevated due to the presence of buildings that process or store radionuclides within the radius of detection, a phenomenon known as "shine." In-situ HPGe survey data were considered as qualitative and were intended to be used in conjunction with other data, particularly laboratory analyses of soil samples, for characterizing the nature and extent of radionuclide contamination in soil.

HPGe results from IHSS 117.2 and the surrounding area indicated an area of elevated americium-241 specific activity occurring east of IHSS 117.2 and west of Building 707, centered north of Building 569. Approximate activities decrease from over 100 pCi/g in this area to less than 1 pCi/g in IHSS 117.2 (DOE 1995). The elevated readings detected east of IHSS 117.2 were attributed to shine from Building 569. PACs 700-123.2, 700-150.5, and 000-162 overlap the area where elevated americium-241 activities were recorded. These areas were characterized in accordance with IASAP Addendum #IA-03-11 (DOE 2003a) and no remediation was required under RFCA.

IHSS 117.2 was investigated as part of IHSS Group 500-4 in accordance with IASAP Addendum #IA-03-05 (DOE 2003b). Radionuclides, metals, and VOCs were targeted as COCs. A total of 209 samples were collected from 85 locations. Eighty-five of the samples were surface soil samples and the remainder were subsurface soil samples ranging up to 11 ft in depth. The only result exceeding the applicable WRW soil AL (DOE et al. 2003) was for arsenic (28 mg/kg) in subsurface soil at one sampling location. This exceedance did not require remediation under RFCA (DOE et al. 1996). Analytical results are presented in the Data Summary Report for IHSS Group 500-4 (DOE 2004b).

No Further Accelerated Action Recommendation

Based on the analytical results and the SSRS presented in the IHSS Group 500-4 Data Summary Report (DOE 2004b), further action is not required at IHSS 117.2. An NFAA determination was justified based on the following:

- Contaminant concentrations were below WRW soil ALs (DOE et al. 2003) with the exception of arsenic in subsurface soil at one location.
- Migration of contaminants to surface water through erosion is unlikely because IHSS 117.2 is not located in an erosion-prone area.

- Migration of contaminants in groundwater will not likely impact surface water because an insufficient quantity of COCs is present in soil at IHSS 117.2. Contaminated groundwater in the vicinity of the IHSS is considered part of the Central IA plume, which was evaluated in the Groundwater IM/IRA (DOE 2005) for possible inclusion in the alternatives analysis. It was determined that an analysis of accelerated action alternatives was not necessary for this plume area. The Final Groundwater IM/IRA document provides a detailed explanation of the screening process (DOE 2005).

After review of the IHSS Group 500-4 Data Summary Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 117.2, on June 18, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 500-4, IHSS 500-117.2, Middle Site Chemical Storage, June 18.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 13 100 Area, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995, Data Summary 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003b, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-05, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 500-4, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005, Final IM/IRA for Groundwater at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-158

IHSS Number: 158
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 500-2
Unit Name: Radioactive Site – Building 551

This Final Update to the HRR for PAC 500-158 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 158 is summarized in this update. The following HRR volumes contain IHSS 158 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

September 1959 to 1970

Historical Summary

There are several documented incidents in which uranium contamination may have been released to the environment in IHSS 158, around the northern portion of Building 551 and around Building 553. The location of IHSS 158 is shown on Figure 19.

Waste boxes were loaded into railroad container cars in the area north of Building 551. Residual contamination may be present as a result of leaks from the boxes. In September 1959, three containers measuring 6,000 to 40,000 cpm were held back from off-site shipment. On June 7, 1961, isolated spots of contamination up to 8,000 cpm were found on the dock and in the helium storage area of Building 553. The contamination was cleaned as a result of the discovery (DOE 1992).

In October 1962, routine spot checks of one load of about 220 drums delivered to the Plant from an offsite vendor indicated uranium contamination up to 1,200 cpm on drum exteriors and up to 7,000 cpm on the drums' interior surfaces. In July 1963 and again in 1970, the Plant received equipment and drums from off site which contained uranium above the acceptable level. The shipments were returned to the vendor (DOE 1992a).

IHSS Investigations

In accordance with the Phase I RFI/RI Work Plan for OU 13 100 Area (DOE 1992b), OU 13 RFI/RI activities at IHSS 158 included vertical soil profiling, surface soil sampling, a soil gas survey, and an HPGe survey.

Vertical soil profiling in IHSS 158 indicated that americium-241, plutonium-239/240, and uranium-235 were not elevated above minimum detectable activities at any depth. Eleven surface soil samples were collected in IHSS 158 and analyzed for metals, radionuclides, and organics. Of the 38 analytes detected, 25 were metals and 13 were radionuclides. Analytes exceeding background levels included chromium up to 102 mg/kg, cobalt up to 29.9 mg/kg, lead

up to 78.8 mg/kg, nickel up to 97.6 mg/kg, zinc up to 1080 mg/kg, americium-241 up to 0.254 mg/kg, plutonium-239/240 up to 0.642 mg/kg, uranium-233/234 up to 1.846 pCi/g, uranium-235 up to 0.372 pCi/g, and uranium-238 up to 4.132 pCi/g. Beryllium, detected up to 1.7 mg/kg, was the only analyte detected above its applicable PPRG (DOE 1995).

Soil gas sampling was conducted on a grid with 20-ft spacing, resulting in 83 soil gas samples in IHSS 158. BTEX (fuel-related aromatic hydrocarbon) compounds were detected along the eastern boundary of IHSS 158, and chlorinated solvents were elevated in the northern, northeastern, and southeastern parts of the IHSS. Based on the history of the IHSS and the geographical distribution of the detections, the BTEX occurrences were apparently associated with Building 551 warehouse operations and the storage of machining wastes. Chlorinated solvent detections were associated with the storage of machining waste and also with the leaking waste boxes discussed above (DOE 1995).

An in-situ HPGe survey was conducted using a truck-mounted HPGe detector with a nominal detection radius of 147.5 ft. Using this system, survey results may be elevated because of the presence of buildings that process or store radionuclides within the radius of detection, a phenomenon known as "shine." In-situ HPGe survey data were considered as qualitative and were intended to be used in conjunction with other data, particularly laboratory analyses of soil samples, for characterizing the nature and extent of radionuclide contamination in soil.

HPGe results from IHSS 158 and the surrounding area indicated an area of elevated americium-241 specific activity occurring east of IHSS 158 and west of Building 707, centered north of Building 569. Approximate activities decrease from over 100 pCi/g in this area to less than 1 pCi/g in IHSS 158 (DOE 1995). The elevated readings detected east of PAC 500-117.1 were attributed to shine from Building 569. PACs 700-123.2 (=700-150.5) and 000-162 overlap the area where elevated americium-241 activities were recorded. These areas were characterized in accordance with IASAP Addendum #IA-03-11 (DOE 2003a) and, in accordance with RFCA (DOE et al. 1996) no remediation was required.

IHSS 158 was investigated in 2003 as part of IHSS Group 500-2 in accordance with IASAP Addendum #IA-03-07 (DOE 2003). A total of 116 samples were collected from 49 locations. The COCs were radionuclides, metals, and VOCs.

All results were less than the applicable RFCA WRW soil ALs (DOE et al. 2003) with the exception of chromium in surface soil at one sampling location, which was detected at 2,600 mg/kg, exceeding the RFCA WRW soil AL of 268 by approximately one order of magnitude. In accordance with ER RSOP Notification #04-14 (DOE 2004b), a RFCA (DOE et al. 1996) accelerated action resulted in the removal of chromium-contaminated soil from an area measuring approximately 4.5 ft by 5 ft by 0.5 ft. Analyses of four confirmation samples indicated the hot spot had been removed and that residual chromium levels were well below the RFCA WRW soil AL (DOE et al. 2003). All characterization and confirmation sampling results are presented in the Closeout Report for IHSS Group 500-2 (DOE 2004c).

No Further Accelerated Action Recommendation

Based on the analytical results and the SRSS presented in the Closeout Report for IHSS Group 500-2 (DOE 2004b), further action was not required at IHSS 158. An NFAA determination was justified based on the following:

- Chromium-contaminated soil surrounding sampling location CA41-025 was removed. Confirmation sampling indicated residual chromium levels were well below the RFCA WRW soil AL (DOE et al. 2003).
- Accelerated action characterization and confirmation sampling results indicated no other contaminant concentrations exceeding RFCA WRW soil ALs (DOE et al. 2003) exist in surface or subsurface soil.

After review of the Closeout Report for IHSS Group 500-2 by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 158 on June 18, 2004 (CDPHE 2004).

Comments

IHSS 158 includes PIC 9.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Draft Closeout Report for IHSS Group 500-2, IHSS 158, Radioactive Site – Building 551, June 18.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan for Operable Unit 13, 100 Area, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995, Data Summary 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-07, IHSS Group 500-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification #04-14, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004c, Closeout Report for IHSS Group 500-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-159

IHSS Number: 159
Current Operable Unit: IA
Former Operable Unit: 9
IHSS Group: 500-3
Unit Name: Radioactive Site – Building 559

This Final Update to the HRR for PAC 500-159 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 159 is summarized in this update. The following HRR volumes contain IHSS 159 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

March 1968 to May 1977

Historical Summary

When Building 559 was built in 1967, the process waste lines installed beneath the building and the adjacent Building 528 were made of Pyrex glass. The glass lines proved to be too brittle to withstand the strain imposed by the normal settling and shifting of the new building, and broken lines led to releases of process waste to the surrounding soil. As shown on Figure 19, IHSS 500-159 is a 5,400-ft² area east of Building 559 where radioactive soil associated with OPWL breaks was excavated and removed.

In 1968, less than a year after Building 559 began operation, a break was discovered in the process waste line from Building 559 to Building 528. In response to the 1968 incident, an area of several hundred square feet was excavated and contaminated soil was removed and disposed of off site (DOE 1992).

In May 1972, a process waste line beneath Building 559 was discovered leaking, and the rupture of the process waste line from Building 559 to the "process waste tank valve pit" (a manway structure between Buildings 528 and 559) caused soil contamination with a gross activity of 4,500 pCi/g. The specific radionuclides associated with this activity were not reported. The contamination decreased from the pit to the concrete pad along the southern side of Building 559. As a result, PVC pipe was installed to bypass the Pyrex line beneath the southern half of Building 559, and the remaining lines were static leak tested. In addition, 82 drums of contaminated soil were removed from above and horizontally adjacent to the process waste line from Building 559 to Building 528, and Building 528 was decontaminated. The soil beneath the process waste line was not removed. Building 559 suspended generation of process waste water, and groundwater was pumped from the footing manhole (located west of the tunnel connecting Buildings 559 and 561) to the process waste tanks in Building 528. No documentation was found that indicated the duration for which process waste generation was suspended (DOE 1992).

In May 1977, "contaminated" groundwater was discovered in the storm drain manhole located approximately 60 ft southwest of the southwestern corner of Building 559. The contamination was believed to be the residue of contamination released in 1972. Also in May 1977, 4,600 gallons of contaminated water leaked into a process waste collection tank in Building 528. The water leaked through a drip leg of the double-contained process waste lines and was fed by a broken 3-inch PVC process water supply line running from Building 559 to Building 561. Gross alpha radiation in the water from the drip leg was measured at 160,000 pCi/L. It was concluded that the process water supply line, process waste line, and shell of the process waste line were probably broken. The primary material of concern was process waste generated at Building 559 (DOE 1992).

IHSS Investigations

Although IHSS 159 was originally identified as part of OU 8, IHSS 159 is not included in any of the OU 8 RFI/RI work plans or reports. The 1992 HRR (DOE 1992) indicated IHSS 159 belonged to OU 9, OPWLs. OU 9 includes Tank 7, which is contained within IHSS 159 and was associated with the process waste leaks that contaminated IHSS 159. Thus OU 9 characterization data for Tank 7 are also relevant to IHSS 159. These data include a sodium iodide (FIDLER) survey, surface and subsurface soil sampling, and groundwater sampling and an HPGe survey as described in the addendum to the OU 9 RFI/RI Work Plan (DOE 1994).

The sodium iodide survey results indicated activities in the vicinity of Tank T-7 were at or near background (DOE 1995).

Boreholes drilled around Tank T-7 were sampled at the surface, immediately above groundwater, and either 1 ft below tank depth or just above bedrock, whichever was encountered first. The COCs for these samples were radionuclides, metals, VOCs, SVOCs, pesticides, PCBs, herbicides, and hexavalent chromium. No analytes were detected above the applicable PPRG in either surface or subsurface soil, but plutonium-239/240 and cadmium were each detected once in surface soil at levels exceeding background. The maximum detected plutonium-239/240 activity was 0.346 pCi/g, and the maximum detected cadmium concentration was 7,560 mg/kg. At one location, carbon tetrachloride was detected at levels below the applicable PPRG in both surface and subsurface soil (DOE 1995). The maximum detected carbon tetrachloride concentration was 4 µg/kg. No other organics were detected.

An in-situ HPGe survey was conducted using a truck-mounted HPGe gamma radiation detector with a nominal detection radius of 147.5 ft. Using this system, survey results may be elevated due to the presence of buildings that process or store radionuclides within the radius of detection, a phenomenon known as "shine." In-situ HPGe survey data were considered as qualitative and were intended to be used in conjunction with other data, particularly laboratory analyses of soil samples, for characterizing the nature and extent of radionuclide contamination in soil.

HPGe results from IHSS 159 and the surrounding area indicated an area of elevated americium-241 specific activity occurring south of IHSS 159 and west of Building 707, centered north of Building 569. Approximate activities decrease from over 100 pCi/g in this area to less than 1 pCi/g in most of IHSS 159 (DOE 1995). The elevated readings detected south of IHSS 159 were attributed to shine from Building 569. PACs 700-123.2, 700-150.5, and 000-162 overlap the area where elevated americium-241 activities were recorded. These areas were characterized in

accordance with IASAP Addendum #IA-03-11 (DOE 2003a) and no remediation was required under RFCA.

IHSS 159 was investigated as part of IHSS Group 500-3 in accordance with IASAP Addendum #IA-03-12 (DOE 2003). Sampling in IHSS 159 included 5 surface soil samples and 39 subsurface soil samples collected from a total of 19 sampling locations were sampled. Many of the subsurface soil samples from IHSS 159 were collected during and after the D&D removal of Building 528 and an associated manway, located in the southern portion of IHSS 159. The samples associated with D&D were generally analyzed for radionuclides only, while those samples collected earlier (pursuant to IASAP Addendum #IA-03-12) were analyzed for radionuclides, metals, and VOCs. A minority of samples collected at Building 528 were also analyzed for pesticides, herbicides, and PCBs.

The only sampling location in IHSS 159 where results exceeded RFCA WRW soil ALs (DOE et al. 2003) was directly beneath a manway that was removed in the southern portion of IHSS 159. The sample, collected at 7.5 to 7.8 ft bgs, yielded americium-241 at 317.5 pCi/g and plutonium-239/240 at 1809.75 pCi/g. Because of their depth, these WRW soil AL exceedances did not require remediation under RFCA (DOE et al. 2003). However, soil at the location was remediated as a BMP because the effort required to remove the soil had been minimized by the uncovering of this soil in the D&D excavation. Remediation was conducted in accordance with ER RSOP Notification #05-02 (DOE 2005). A confirmation sample was collected after removal, verifying that the hot spot had been completely removed. All accelerated action characterization and confirmation sampling results are presented in the Closeout Report for IHSS Group 500-3 (DOE 2005b).

In addition to the removal of soil, the accelerated action implemented under ER RSOP Notification #05-02 also included the removal of OPWL and associated features throughout IHSS 159. OPWL P-17, which runs north and south through the western portion of IHSS 159, was completely removed. An OPWL manway north of Building 528 was completely removed. Building 528 and OPWL Tank 7, which was housed in Building 528, were completely removed (DOE 2005c, 2005d).

No Further Accelerated Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA is justified for IHSS 159 based on the following:

- Plutonium-239/240 and americium-241 contaminated soil in the subsurface was removed and confirmation sampling data verified that remediation was complete. No other exceedances were identified in this IHSS and there is no residual contamination in IHSS 159 exceeding the RFCA WRW soil ALs (DOE et al. 2003).
- The SRSS for IHSS 159, presented in the Closeout Report for IHSS Group 500-3 (DOE 2005b), supported an NFAA recommendation.

Following a review of the Closeout Report for IHSS Group 500-3 by the regulatory agencies, DOE received approval of the NFAA status of IHSS 159 from CDPHE (the LRA) on June 24, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFPO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 500-3 (B559) – NFAA Approval, June 24.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Final Technical Memorandum No. 1, Addendum to Phase I RFI/RI Work Plan, Field Sampling Plan, Original Process Waste Lines, Volume I-Tanks, Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Draft Data Summary Report No. 2, Operable Unit No. 9, Outside Tanks, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-12, IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005b, Final Closeout Report for IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005c, Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005d, Closeout Report for IHSS Group 000-4 New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-169

IHSS Number: 169
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: None
Unit Name: Waste Drum Peroxide Burial

This Final Update to the HRR for PAC 500-169 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 169 is summarized in this update. The following HRR volumes contain IHSS 169 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998);
Update Report – 2000 Annual (DOE 2000); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

April 1981

Historical Summary

The location of IHSS 169 is shown on Figure 19. During the week ending April 24, 1981, warehouse personnel were transporting three 55-gallon drums of hydrogen peroxide when two of the drums fell off a pallet. One of the drums burst open and the peroxide drained into a culvert at the corner of Fifth and Central Avenues. A second source states that in April 1981, a 55-gallon drum of 35 percent hydrogen peroxide (H_2O_2) solution spilled at the warehouse (no associated building number is given). The content of the drum leaked out and was flushed into a hole with water. According to the RCRA 3004(u) Report (DOE 1987), a 55-gallon drum of hydrogen peroxide was buried in the chemical storage area east of Building 551. The location of this event is thought to be the same as that described in PAC 400-191 (see Comments) (DOE 1992a).

A hole was dug east of Fifth Avenue, in the Central Avenue Ditch was hosed down allowing the diluted peroxide to drain into the hole. The hole was refilled on April 23, 1981 (DOE 1992a).

Hydrogen peroxide is a strong oxidizer supplied in an aqueous solution. It is an unstable liquid that decomposes rapidly in the environment.

IHSS Investigations

IHSS 169 was included in the OU 13 RFI/RI, but because hydrogen peroxide degrades in the near-surface environment to nonhazardous end products, no PCOCs were identified and no samples were collected (DOE 1992b, 1995).

Consistent with the findings presented in the HRR and OU 13 documents (DOE 1992, 1994, 1995), IHSS 169 was proposed for NFA in the 1998 Annual Update to the HRR (DOE 1998). However, based on comments received from the regulatory agencies on July 9, 1999 (EPA and

CDPHE 1999), GPR techniques were used on June 29, 2000, to determine whether a buried drum existed in the area. An area approximately 60 ft by 40 ft was surveyed at a 2-ft grid spacing using GPR.

Four anomalies appeared on the GPR strip charts as dense shallow objects. Three of the locations were believed to be remnant concrete pieces associated with a former fence at this location, or rocks. Based upon density readings, the fourth location was considered to be a large, dense metallic object, not likely a drum (K-H 2000).

No Further Accelerated Action Recommendation

IHSS 169 was proposed for NFAA for several reasons. First, it is unclear whether a drum of hydrogen peroxide was actually disposed in the chemical storage area. Second, the results of the GPR survey did not indicate the presence of a buried drum. Third, hydrogen peroxide readily breaks down into water and oxygen, a process that would have certainly run its course in the more than 20 years since the reported release. Accordingly a historic 55-gallon hydrogen peroxide release to soil does not constitute an ongoing threat to human health or the environment. Lastly the chemical storage yard lies within PAC 500-117.2, which was investigated in accordance with IASAP Addendum #IA-03-05 for IHSS Group 500-4 (DOE 2003). Over 200 statistical samples were collected to characterize IHSS 117.2 and the only RFCA WRW soil AL (DOE et al. 2003) exceedance was of arsenic in subsurface soil, and no remediation was required under RFCA (DOE 2004b).

After a review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 169 on February 20, 2004 (CDPHE 2004).

Comments

The description of PAC 400-191 (IHSS 191) in the 1997 Update to the HRR (DOE 1997) is identical to the description of IHSS 169 and is based on the same two sources. The NFA determination for IHSS 191 was approved by regulatory agencies in 1999 (EPA and CDPHE 1999). Accordingly the focus for IHSS 169 was the hydrogen peroxide release based on the RCRA 3004(u) Report (DOE 1987).

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, No Further Accelerated Action (NFAA), PAC 500-169 Waste Drum Peroxide Burial, February 20.

DOE, 1987, Appendix 1, Resource Conservation and Recovery Act 3004 (u) Waste Management Units, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

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DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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DOE, 2004b, Final Data Summary Report for IHSS Group 500-4, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

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EPA and CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from T. Rehder, EPA Region VIII and S. Gunderson, CDPHE, RE: 1997 Annual HRR Review, July 9.

K-H, 2000, Building 551 Ground Penetrating Radar Report, conducted June 19, 2000, Rocky Flats Environmental Technology Site, Golden, Colorado.

PAC REFERENCE NUMBER: 500-197

IHSS Number: 197
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: 500-1
Unit Name: Scrap Metal Sites – 500 Area

This Final Update to the HRR for PAC 500-197 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 197 is summarized in this update. The following HRR volumes contain IHSS 197 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Approximately 1958 to Early 1960s

Historical Summary

The location of IHSS 197, a scrap metal storage area, is shown on Figure 19. In approximately 1958 or possibly in the early 1960s, scrap metal components, primarily from the original plant construction program, were buried in trenches in the central portion of the plant site, west or southwest of Building 559. A second scrap metal burial site was located northwest of the first site. It contained building construction debris from early plant construction, most likely from the Austin Company. Early records do not document replacement of any transformers at Rocky Flats, therefore, there is only a slight possibility that transformers containing PCBs were disposed at the construction debris site (DOE 1992a).

The scrap metal burial trenches appear to be associated with Rocky Flats PU&D Yards (PAC NW-170) located east and northeast of the Warehouse (Building 551). The PU&D yards near Building 551 were used for storage of such materials from 1955 onward. Rocky Flats photographs from 1959 and 1960 show storage of aluminum turnings and other scrap metal in these yards. The transfer of property to PU&D was highly proceduralized to ensure that radioactively contaminated materials were not received. Scrap metal typically was stored at the PU&D Yards until sufficient quantity had accumulated for sale to private sources (DOE 1992a).

Periodically during the history of the Building 551 PU&D Yards, trenches were excavated at or near the yards to bury unusable scrap metal. It is believed that the metals excavated from trenches at PAC 500-197 in 1981 are at least in part, if not entirely, related to this practice. Former Rocky Flats employees identified an area north of Building 552 where aluminum and steel scrap were buried in a large hole (DOE 1992b).

During the week ending September 4, 1981, excavation related to construction of the PA (former PSZ) unearthed an old scrap metal burial site immediately west of Building 559. A second scrap metal burial site located west of Building 559 and northwest of the first site, was also unearthed. On September 9, 1981, work began to remove buried material from the trenches, and excavation

and disposal were completed by October 2, 1981. The material unearthed consisted of moist, but not oily, scrap metal consisting of machine turnings, rings, shapes, overlays, and other metal parts. Although some of the buried material originated from process areas and could have been radioactively contaminated, monitoring of the materials using a FIDLER indicated no detectable radioactivity. In addition, total long-lived alpha concentrations from three portable air samplers at the Building 559 cleanup area showed zero count. Transformers or related material were not present in the material excavated from the scrap metal trenches. According to an internal letter, the material was disposed in the Present Landfill (PAC NW-114) (DOE 1992a).

IHSS Investigations

IHSS 197 was originally part of OU 16, a group of sites that were expected not to require further action. However, upon reviewing historical information available for IHSS 197, it was determined that it did require further investigation and that the investigation would be combined with PAC 500-117.1 (DOE 1992b). Therefore IHSS 197 was transferred to OU 13 and investigated along with IHSS 117.1 (DOE 1995).

OU 13 RFI/RI activities in IHSS 197 included vertical soil profiling, surface soil sampling, a soil gas survey, asphalt sampling, and an HPGe survey as described in the OU 13 Phase I RFI/RI Work Plan (DOE 1992c).

The results of vertical soil profiling in IHSS 197 indicated americium-241 and plutonium-239 were not elevated above minimum detectable activities, while uranium-235 was slightly elevated (but well below Site background) in one sample (DOE 1995).

Surface soil samples were collected at five locations in IHSS 197 and were analyzed for metals, radionuclides, and VOCs. A total of 31 analytes were detected in the samples including four inorganics (copper, silver, zinc, and plutonium-239/240) that were detected at concentrations exceeding background levels. Maximum observed concentrations included copper at 56.3 mg/kg, silver at 20.8 mg/kg, zinc at 416 mg/kg, and plutonium-239/240 at 0.045 pCi/g. None of the sample results exceeded the applicable PPRGs (DOE 1994).

OU 13 RFI/RI soil gas sampling in IHSS 197 included 40 initial screening samples and 5 follow-up samples. Chlorinated solvents were detected along the northern end of IHSS 197, including carbon tetrachloride at 930 µg/L. This may be associated with the storage of scrap metal and machine turnings in this area, as chlorinated solvents are commonly used as degreasers. BTEX (fuel-related aromatic hydrocarbon) compounds were detected in the southern portion of IHSS 197 between the PA fence and Seventh Street, which is expected because this area borders a major street and also because construction debris was buried in the area. Toluene was detected in this area at up to 22 µg/L (DOE 1995).

Asphalt was sampled at two locations in IHSS 197 and was analyzed for metals. Silver was elevated in one of the samples but did not exceed the PPRG. No other metals were elevated relative to background concentrations (DOE 1995).

An in-situ HPGe survey was conducted using a truck-mounted HPGe gamma radiation detector with a nominal detection radius of 147.5 ft. Using this system, survey results may be elevated due to the presence of buildings that process or store radionuclides within the radius of detection, a phenomenon known as "shine." In-situ HPGe survey data were considered as qualitative and

were intended to be used in conjunction with other data, particularly laboratory analyses of soil samples, for characterizing the nature and extent of radionuclide contamination in soil.

HPGe results from IHSS 197 and the surrounding area indicated an area of elevated americium-241 specific activity occurring east of IHSS 197 and west of Building 707, centered north of Building 569. Approximate activities decrease from over 100 pCi/g in this area to less than 1 pCi/g in the northern portion of IHSS 197. Specific activities within IHSS 197 were in the 0.1 to 10 pCi/g range (DOE 1995). The elevated readings detected east of IHSS 197 were attributed to shine from Building 569. PACs 700-123.2, 700-150.5, and 000-162 overlap the area where elevated americium-241 activities were recorded. These areas were characterized in accordance with IASAP Addendum #IA-03-11 (DOE 2003a) and no remediation was required under RFCA.

Based on IHSS 197 site history and historical soil sampling results, radionuclides, metals, PCBS, and VOCs were identified as COCs. Surface (0 to 0.5 ft bgs) and subsurface (0.5 to 6.5 ft bgs) soil samples were analyzed in accordance with IASAP Addendum #IA-04-03 (DOE 2003b). Arsenic was detected at a concentration of 25.9 mg/kg in one subsurface soil sample, exceeding the RFCA WRW soil AL of 22.2 mg/kg (DOE et al. 2003). The location did not require remediation under RFCA. No other COCs were detected at levels exceeding applicable RFCA WRW soil ALs (DOE et al. 2003). Analytical results are presented in the Data Summary Report for IHSS Group 500-1 (DOE 2004b).

No Further Accelerated Action Recommendation

NFAA was recommended for IHSS 500-197 based on the following:

- Accelerated action sampling results were less than WRW ALs, with the exception of one subsurface arsenic concentration of 25.9 mg/kg. Because this was an isolated detection and less than the WRW soil AL, action was not necessary.
- No further action was recommended based on the SRSS presented in the Data Summary Report for IHSS Group 500-1 (DOE 2004b).

After review of the Data Summary Report for IHSS Group 500-1 by regulatory agencies, DOE received approval from CDPHE (the LRA) of NFAA status for IHSS 197, on September 29, 2004 (CDPHE 2004).

Comments

None

References

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DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final No Further Action Justification Document Rocky Flats Plant Low Priority Sites (Operable Unit 16), Rocky Flats Plant, Golden, Colorado, October.

DOE, 1992c, Final Phase I RFI/RI Work Plan, Rocky Flats Plant, Area 100, Operable Unit 13, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1994, Programmatic Risk-Based Preliminary Remediation Goals for the Rocky Flats Environmental Technology Site, Final, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Data Summary 2 Operable Unit No. 13 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003b, Industrial Area Sampling and Analysis Plan Addendum #IA-04-03, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004a, Historical Release Report 2004 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 500-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-900

IHSS Number: Not Applicable
Current Operable Unit: 1A
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Leak – 515/516

This Final Update to the HRR for PAC 500-900 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-900 is summarized in this update. The following HRR volumes contain PAC 500-900 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to January 1986

Historical Summary

As shown on Figure 19, PAC 500-900 (Transformers 515 and 516) were located within the PA west of Building 566 (the new laundry). Transformer 515 rests on the northern side of a switchgear building and Transformer 516 is located on the southern side of the same building. As presented in the HRR (DOE 1992), an EPA inspection in January 1986 identified one of the transformers at the 515/516 Substation in violation of TSCA due to leaking. A leak at the 515/516 Substation was included in the June 1986 penalty calculation for PCB violations. It is believed that the referenced leak occurred on the eastern side of Transformer 516. In September 1986, Transformers 515 and 516 were reported as leaking. A photograph dated September 1986, shows staining visible on the concrete pad beneath the Transformer 516 drain valve (DOE 1992).

In 1985, analytical results indicated the oil in Transformers 515 and 516 contained less than 50 ppm PCBs. In October or November of 1985, and again in June, 1986, it was reported that the coolant oil in Transformers 515 and 516 contained 63 ppm and 65 ppm PCBs, respectively. Following a January 1986 inspection, approximately 9 ft² of soil beneath a valve at the 515/516 substation was found to be contaminated with PCB-contaminated oil. In November 1986, smear samples collected from the Transformer 515 drain valve and concrete pad indicated 3.3 ppm and 2.5 ppm PCBs, respectively. In 1986, the fluid in Transformers 515 and 516 was drained and replaced with non-PCB dielectric oil. Additional records indicate samples were collected in 1992 showing PCB contamination levels in the 515 and 516 Transformer dielectric oil were 3 ppm and less than 1 ppm, respectively (DOE 1992).

Oil containing between 50 and 500 ppm PCBs is believed to have been released to the environment at this site; however, differentiation between the two transformers is vague in historical records (DOE 1992).

In January 1987, it was recommended that the concrete pad underlying Transformer 516 be coated with sealant (DOE 1992).

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in 1991, soil samples were collected and analyzed for PCBs using EPA Method 8080 (EG&G 1991). The results indicated PCB levels adjacent to the 515 and 516 transformers were less than 120 ppb and less than 26 ppm, respectively (DOE 1996).

In accordance with the approved Final PAM for Remediation of PCBs (DOE 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil screening samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080. Approximately 6 cy of PCB-contaminated soil were excavated from the east side of Transformer 516 in July, 1995, containerized, and disposed (DOE 1997).

Based on the 1995 final cleanup analytical results, PCB concentrations in the soil were less than 10 ppm using EPA Method 4020 and less than 934 ppb using EPA Method 8080. PCB concentrations for the concrete samples were less than 860 ppb. Thus the 25 ppm PCB cleanup level was achieved at this PAC and no further action was warranted (DOE 1996).

The 515/516 Substation was demolished in FY2001. The two transformers and switchgear were sold to a local vendor.

No Further Accelerated Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW soil AL of 12.4 ppm, adequately protects human health (DOE et al. 2003). Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Analytical results following the 1995 cleanup confirmed attainment of the 25 ppm PCB cleanup level. Based on site data and White Paper findings noted above, NFAA was proposed for PAC 500-900 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c). After a review of the White Paper by the

regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status of PAC 500-900 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

DOE, 1991, Assessment of Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, July.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Historical Release Report 2004 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-901

IHSS Reference Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Leak – 555

This Final Update to the HRR for PAC 500-901 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-901 is summarized in this update. The following HRR volumes contain PAC 500-901 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to June 1986

Historical Summary

Transformer 555 is one of two large transformers making up the 555/558 electrical substation located near the intersection of Seventh Street and Central Avenue (Figure 19). Transformer 558 was located on the north side of a switchgear building connecting the two transformers. In June 1986, during routine maintenance, Transformer 555 was reported to have been leaking dielectric coolant oil. The transformer was again reported as leaking in September 1986. Soil contaminated with PCBs was identified in a confined area east of the 558 transformer concrete pad during a sitewide sampling program in August 1991 (DOE 1996).

Historical records indicate that Transformer 555 contained fluid with 55 ppm PCBs. Smear samples collected from the transformer valve and adjacent areas prior to 1986 confirmed that small quantities (up to 6.2 ppm) of PCBs had been released. No documentation was identified for sampling of the dielectric oil or surrounding area at the associated 558 transformer site (PAC 500-905) prior to August 1991. Samples collected from the concrete pads underlying the 555/558 transformers were analyzed for PCBs using EPA Method 8080; the highest result was 0.43 ppm.

In 1986, the 555 transformer was retrofilled with a non-PCB dielectric oil and reenergized. In 1996, the 555/558 Substation was demolished and replaced with a more modern facility. The transformers were shipped by rail to a licensed offsite facility for incineration.

PCB levels remaining in the soil at PAC 500-901 following excavation were less than 10 ppm using EPA Method 4020 and less than 1.3 ppm using EPA Method 8080. Thus the 25 ppm PCB cleanup level (DOE 1995) has been achieved for PAC 500-901 (Transformer 555) and no further action was warranted.

PAC Investigations

As part of the Sitewide Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected and analyzed (EG&G 1991). The results indicated PCB concentrations in soil adjacent to Transformer 555 were less than 4.0 ppm (DOE 1995).

In accordance with the approved Final PAM for Remediation of PCBs (DOE 1995), follow-up sample screening was completed in July of 1995 using Midwest Research Institute (MRI) methods to verify the lateral and vertical extent of PCB migration. Approximately 5 cy of PCB-contaminated soil was excavated immediately west of the 558 transformer pad. The soil was containerized and disposed (DOE 1997).

The 555/558 Substation was demolished in FY1996.

No Further Accelerated Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW soil AL of 12.4 ppm, adequately protects human health (DOE et al. 2003). Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on White Paper findings and the results of verification samples that followed the removal of contaminated soil, NFAA was proposed for PAC 500-901 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c). After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 500-901 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EG&G, 1991, Assessment of Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, July.

PAC REFERENCE NUMBER: 500-902

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Leak – 559

This Final Update to the HRR for PAC 500-902 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-902 is summarized in this update. The following HRR volumes contain PAC 500-902 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to 1987

Historical Summary

Transformer 559-1 (PAC 500-902) is located on the eastern side of Building 559 (Figure 19). Transformer 559-1 contained 235 gallons of dielectric cooling fluid. In October and November 1985, it was reported that Transformer 559-1 contained PCB fluid exclusively (PCBs > 500 ppm). In March 1989, it was reported that Transformer 559-1 contained fluid with 500,000 ppm PCBs (DOE 1992). Prior to relocation and retro-filling in 1987, this transformer leaked oil containing PCBs from a faulty valve (DOE 1992).

In October 1986, Transformer 559-1 was scheduled for cleaning at the drain valve and at the case near the drain valve. In 1987, the transformer was retro-filled and relocated on a new concrete pad several feet to the south of its previous location. Concrete material was removed from the previous location of the transformer. In March 1989, it was reported that Transformer 559-1 had been replaced under the Environmental Hazards Elimination Project.

Building 559 and associated structures were demolished in 2005 (DOE 2005).

PAC Investigations

As part of the Sitewide Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected in accordance with approved EPA sampling protocols, and analyzed for PCBs using EPA Method 8080 (DOE 1991). Based on 1991 analytical results, the highest PCB concentration found adjacent to the old concrete transformer pad was 190 ppm (DOE 1995).

Under the approved Final PAM for Remediation of PCBs (DOE 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA

Method 8080. Based on the results, approximately 25 cy of PCB-contaminated soil was excavated in October, 1995, containerized, and disposed (DOE 1997).

Based on the 1995 final cleanup analytical results, residual concentrations of PCBs in soil were less than 10 ppm using EPA Method 4020 and less than 2.4 ppm using EPA Method 8080. PCB contamination levels on the concrete transformer pad are less than 41 ppb using EPA Method 8080. Thus the 25 ppm PCB cleanup level (DOE 1995) has been achieved at this PAC and no further action is warranted.

No Further Accelerated Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW soil AL of 12.4 ppm, adequately protects human health (DOE et al. 2003). Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on residual concentration data and White Paper findings noted above, NFAA was proposed for this PCB site in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c). After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) on NFAA status for PAC 500-902 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

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DOE, 1996, Historical Release Report 1996 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Historical Release Report 2004 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2005, Final Project Closeout Report for Building 559 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-903

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: RCRA Storage Unit #1

This Final Update to the HRR for PAC 500-903 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-903 is summarized in this update. The following HRR volumes contain PAC 500-903 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1988 to 1991

Historical Summary

PAC 500-903, the location of a container used for RCRA waste storage, was immediately outside the PA between Buildings 551 and 559 (Figure 19).

On June 21, 1988, a leak was discovered from a drum in the hazardous waste storage site cargo container. Less than four fluid ounces of liquid containing between 59 ppm and 63 ppm PCBs was released into the cargo container. In response to the June 1988 incident, the leaking drum was placed into an overpack drum. The cleanup debris was placed into a waste drum.

On December 16, 1991, a release was discovered during a weekly inspection at RCRA Storage Unit #1. The release was completely contained within the secondary containment pan inside the cargo container. In the December 1991 incident, approximately 40 gallons of TRIM-SOL™ lubricant mixed with waste oil was released into the secondary containment pan.

In response to the December 1991 release, the leaking drum was placed into an overpack drum. The liquid in the secondary containment pan and the liquid remaining in the leaking drum were pumped into a new drum. Absorbent was added to the empty drum. The secondary containment pan, rollers, and grating were cleaned. RCRA CIPR 91-035 describes this event.

The December 1991 incident did not release any contaminant to the environment outside the cargo container.

PAC Investigations

No further investigation was required, because there was no release of contaminants to the environment.

No Further Accelerated Action Recommendation

Based on information in the 1992 HRR, the historic spills at PAC 500-903 were fully contained within the cargo container and there was no significant release to the environment. Therefore PAC 500-903 was proposed for NFA. DOE received approval of the NFA status of PAC 500-903 from CDPHE and EPA (the LRA) on February 14, 2002 (CHPHE and EPA 2002).

Comments

RCRA Unit #1 was closed in accordance with the Closure Description Document for RCRA Permitted Container Storage Unit 18.03, Unit 1, Unit10 (DOE 2003). The closure was accomplished using the "Debris Rule Decontamination" method as described in the Closure Plan, Section X of the RCRA Part B Permit (CHPHE 1997). The secondary containment pans and rollers in the pans were decontaminated by rinsing and the rinse water was removed, characterized, and managed accordingly. The surfaces were then visually inspected and certified clean by a Professional Engineer. CDPHE approved the Closure of this RCRA Unit on October 29, 2004 (CDPHE 2004).

References

CDPHE, 1997, RCRA Part B Permit C0-097-05-03-01.

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, and S. Nesta, K-H, from S. Gunderson, CDPHE, RE: Acceptance, Closure Summary Report for Closure of RCRA Unit Container Storage Units 18.03, 10, and 1, October 29.

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Closure Description Document for RCRA Permitted Container Storage Unit 18.03, Unit 1, Unit10, Rocky Flats Environmental Technology Site, Golden, Colorado, November 16.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-904

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 500-5
Unit Name: Transformer Leak – 223-1/223-2

This Final Update to the HRR for PAC 500-904 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-904 is summarized in this update. The following HRR volumes contain PAC 500-904 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to 1987 to after 1990

Historical Summary

The location of PAC 500-904 (Transformers 223-1 and 223-2) is shown on Figure 19. Transformers 223-1 and 223-2 leaked small amounts of oil prior to 1987 (DOE 2001). In February 1986, the valve, tap changer, and bushings of Transformer 223-1 were reported leaking, and in January 1987, residual staining was noted on the concrete pad underlying Transformer 223-2. Analytical data from approximately 1985 indicated the oil in Transformer 223-1 contained more than 500 ppm PCBs and that the oil in Transformer 223-2 contained less than 50 ppm PCBs. In October and November 1985, it was reported that the dielectric fluid in Transformers 223-1 and 223-2 contained 19,800 and 296 ppm PCBs, respectively. In November 1986, a smear sample collected from the concrete underlying the drain valve of Transformer 223-1 indicated less than 50 micrograms per square centimeter ($\mu\text{g}/\text{cm}^2$) of PCBs. Reportedly, the transformers were retrofilled with non-PCB cooling oil in 1987, and Transformer 223-1 was reportedly replaced in March 1989. Sometime during the 1990s, non-PCB oil from the western transformer was released to the environment, probably due to overfilling the oil reservoir, resulting in an oil stain in the soil north of the pad (DOE 2004b).

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, surface soil samples were collected and analyzed in accordance with approved EPA protocols (DOE 1995). The samples were analyzed for PCBs using EPA Method 8080 and plutonium-239/240 using alpha spectrometry. The soil data indicated concentrations of Aroclor-1254 exceeded the RFCA WRW soil AL (DOE et al. 2003) at two locations (DOE 2004b).

In 2003, PAC 500-904 was investigated in accordance with IASAP Addendum #IA-04-03 for IHSS Group 500-5 (DOE 2003). Eight locations were sampled, and at each location one surface

soil (0 to 0.5 ft bgs) and one subsurface soil (typically 0.5 to 2.5 ft bgs) were collected. All samples were analyzed for PCBs, which were the only COCs. At the request of CDPHE, two samples collected at the sampling locations with the highest historical PCB concentrations were also analyzed for dioxins and furans. Aroclor-1260 was detected in 15 of the 16 samples at concentrations ranging from 9.6 to 2,300 µg/kg. All results were well below the RFCA WRW soil AL of 12,400 µg/kg. Complete analytical results from the characterization are presented in the Data Summary Report for IHSS Group 500-5 (DOE 2004b).

Following accelerated action sampling, the two transformer pads and the oil-stained soil north of the western pad were removed during May 2004 as a BMP. In addition, a third pad in the area, which contained a non-PCB transformer and is not part of this or any PAC, was removed at the same time (DOE 2004b).

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004c) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW soil AL of 12.4 ppm, adequately protects human health (DOE et al. 2003). Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates the following:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on accelerated action data and the SSRS, the Data Summary Report for IHSS Group 500-5 concluded that an NFAA determination for PAC 500-904 is justified for the following reasons:

- All PCB concentrations in surface soil are less than RFCA WRW soil ALs.
- Migration of contaminants to surface water through erosion is unlikely because PAC 500-904 is not in an area prone to landslides.
- Residual PCBs at the site are not likely to affect surface water or groundwater because PCBs are not generally mobile in soil.
- The summed toxicity equivalents (TEQs) for both sampling locations where samples were analyzed for dioxins and furans do not exceed the EPA residential cleanup guidance of 1,000 picograms per gram (pg/g). (Because there are no existing RFCA ALs for dioxins and furans, results for dioxins and furans were converted to TEQs using toxicity equivalent factors [TEFs] in accordance with SW8290 [EPA 1994] and a World Health Organization [WHO] study [1998]. The TEQ values were summed for each sampling location and

compared to the EPA residential cleanup guidance level [EPA 1998] and Front Range background concentration ranges [EPA 2001]).

After review of the Data Summary Report for IHSS Group 500-5 by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 500-904 on May 17, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Data Summary Report for IHSS Group 500-5, PAC 500-904 (April 2004), May 17.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-04-03, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 500-5, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004c, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 1994, Test Methods for Evaluating Solid Waste, EPA Publication No. SW-846, September.

EPA, 1998, Approach for Addressing Dioxins in Soil at CERCLA and RCRA Sites, OSWER Directive 9200.4-26, Memo from Timothy Fields, Jr., April.

EPA, 2001, Denver Front Range Study Dioxins in Surface Soil, July.

WHO, 1998, Assessment of the Heath Risk of Dioxins: Re-Evaluation of the Tolerable Daily Intake (TDI), WHO European Center for Environment and Health, Geneva, Switzerland, May.

PAC REFERENCE NUMBER: 500-905

IHSS Reference Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Leak – 558-1

This Final Update to the HRR for PAC 500-905 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-905 is summarized in this update. The following HRR volumes contain PAC 500-905 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to June 1986

Historical Summary

Transformer 558-1 was one of two large transformers making up the 555/558 electrical substation once located near the intersection of Seventh Street and Central Avenue (Figure 19). Transformer 558-1 is located on the northern side of the switchgear building connecting the two transformers (DOE 1996). There was evidence of leakage on a valve on the northeastern side of Transformer 558-1. The transformer had been situated on a concrete pad surrounded by rock fill. There was no berm around the transformer (DOE 1992).

No documentation was identified for sampling of the dielectric oil or the surrounding soil at the Transformer 558-1 site prior to August 1991 (DOE 1996). As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected and analyzed. The results indicated PCB contamination existed primarily in one area of the substation immediately west of the Transformer 558-1 pad. PCB levels of 480 ppm were identified at this discrete location (DOE 1992).

No documentation was found that indicated Transformer 558 was retrofilled; however, one reference indicates that a schedule was initiated for cleanup to take place at the substation on August 21, 1989 (DOE 1992). No cleanup was performed at that time (DOE 1996).

PAC Investigations

In accordance with the approved Final PAM for Remediation of PCBs (DOE 1995), follow-up sample screening was completed in July 1995 to verify the lateral and vertical extent of PCB migration. Approximately 5 cy of PCB-contaminated soil were excavated immediately west of the 558 transformer pad. The soil was containerized and disposed (DOE 1997).

PCB levels remaining in the soil following excavation were less than 10 ppm using EPA Method 4020 and less than 1.3 ppm using EPA Method 8080. Thus the 25 ppm PCB cleanup level (DOE 1995) has been achieved for PAC 500-901 (Transformer 555) and no further action is warranted.

On July 10, 1996, under an electrical upgrade construction project, the 558/555 substation was demolished and replaced with a more modern facility. The transformers were shipped to off-site (DOE 1996).

No Further Accelerated Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW soil AL of 12.4 ppm, adequately protects human health (DOE et al. 2003). Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on residual concentrations and the White Paper findings noted above, NFAA was proposed for PAC 500-905 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c). After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for the site on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-906

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 500-6
Unit Name: Asphalt Surface near Building 559

This Final Update to the HRR for PAC 500-906 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-906 is summarized in this update. The following HRR volumes contain PAC 500-906 information:

Update Report – Fourth Quarterly (DOE 1993);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

March 22, 1993

Historical Summary

As shown on Figure 19, PAC 500-906 is located on the northern side of Building 561. On March 22, 1993 at 2:00 P.M., approximately 1 gallon of F001 wastewater spilled onto the pavement from a hose that was used to extract excess water from a tanker. The water was from the P304 sump, which collects groundwater from the exterior of the Building 559/561 tunnel and the Building 561 basement. Normally this water was released into the surface water drainage system through pumping to a footing drain system that flows by gravity. However, the water in question was found to exceed Segment 5 stream standards for some analytes, and was thus being removed by tanker. The tanker was accidentally filled beyond the level allowed by Rocky Flats Transportation Guidelines, which require that no more than four-fifths of the capacity of the tanker be used. After approximately 1,000 gallons of water had been off-loaded from the tanker into drums, the hose used for the operation leaked some water as it was transferred back to storage (DOE 1993).

The water contained F001 hazardous waste constituents, including carbon tetrachloride, trichloroethene, and 1,1-dichloroethene, based on four sampling events that occurred from July 1992 through March 1993. Analytes covered by TCLP were also identified, but the concentrations were below those of a characteristic RCRA hazardous waste. Contamination levels exceeded Segment 5 stream standards for some constituents (DOE 1993).

Oil-Dri™ absorbent was used to absorb the water and was then managed as RCRA-regulated hazardous waste after use in a RCRA permitted storage area. The incident was reported to the regulatory agencies in CPIR No. 93-004, as well as the Fourth Quarterly Update to the HRR (DOE 1993).

Hazardous constituents released to the environment are believed to be minimal, if any, due to the small amount of material spilled on the asphalt surface and the immediate cleanup response. The

characterization sampling described above confirms that VOCs did not reach the underlying soil horizon.

Spill pans were subsequently used during transfer operations. These spill pans were effective in providing secondary containment for any possible releases.

PAC Investigations

For purposes of accelerated action, PAC 500-906 was identified as IHSS Group 500-6. The soil immediately under the asphalt surface was sampled in April 2002 in accordance with IASAP Addendum #IA-02-01 (DOE 2001). Two soil samples were collected and analyzed for VOCs. All analytical results were less than RFCA Tier II (DOE et al. 1996) and WRW soil ALs (DOE et al. 2003). Of the VOCs detected, the highest concentration was 24 µg/kg for total xylenes. The three other VOCs were all less than 10 µg/kg (DOE 2003b)

No Further Accelerated Action Recommendation

Based upon the characterization results presented in the Data Summary Report for IHSS Group 500-6 (DOE 2003b), soil concentrations are below RFCA Tier II and WRW soil ALs for the PCOCs and no contaminant source could be identified. PAC 500-906 was therefore proposed for NFAA.

DOE received approval of NFAA status for PAC 500-906 on July 16, 2003 from CDPHE (the LRA) (CDPHE 2003).

Comments

In relation to this incident, the October 2000 renewal of the NPDES Permit contained provisions that allowed for the discharge of this groundwater (with restriction to volume and contaminant concentration) to the sanitary collection system (EPA 2000).

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Final Data Summary Report for IHSS Group 500-6, July 16.

DOE, 1993, Fourth Quarterly Update to the Historical Release Report, Rocky Flats Plant, Golden, Colorado, July.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01 Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Historical Release Report 2002 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Historical Release Report 2003 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 500-6, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-907

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 500-7
Unit Name: Tanker Truck Release of Hazardous Waste from Tank 231B

This Final Update to the HRR for PAC 500-907 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-907 is summarized in this update. The following HRR volumes contain PAC 500-907 information:

Update Report – Ninth Quarterly (DOE 1994); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

July 13 and 20, 1994

Historical Summary

As shown on Figure 19, PAC 500-907 was located northwest of Building 551 and southwest of Tank 231B. At approximately 9:30 A.M. on July 13, 1994, during a RCRA tank inspection, evidence of a release was observed near Building 231. At the time of the discovery, sludge was being transferred from Tank 231B to a tanker truck in an effort to lower the level of sludge in the stationary tank for valve repair. Approximately 0.5 lb of dried sludge was released to the soil. At this same location on July 20, 1994, 4 gallons of liquid from the tanker were released to a secondary containment spill basin because a hose coupling was unlocked. It was estimated that more than 1 lb of liquid was sprayed onto two workers and adjacent soil both east and west of the spill basin (DOE 1994).

The liquid was rinse water used to flush the transfer line and tanker drain hose. The sludge from the tanker contained an F-listed waste; therefore the rinse water was being treated as a hazardous waste under the mixture rule. The EPA waste codes assigned to the waste contained in the 231 tank system include D004, D006, D007, D008, D009, D010, D011, F001, F002, F003, F005, F006, F007, F009, and F039. No residual contamination was detected in preliminary samples (DOE 1994).

Radiological surveys of the surrounding soil and basin area were conducted using a Bicon and SAC-4 instrument. The highest detected level of radioactive contamination was 651 dpm. Contaminated soil was containerized and the basin area was decontaminated (DOE 1994).

The area was cordoned off and posted immediately due to the radiological contamination. A wet vacuum was used to remove the liquid from the spill basin, and radiological control technicians (RCTs) smeared the tanker and the basin area. Approximately 30 lb of soil was removed on July 13, 1994 from the first release, followed by an additional 40 lb of soil from the second release on July 20 and 21, 1994. According to the HRR Ninth Quarterly Update (DOE 1994), "the soil was

containerized in a drum and was managed as low-level mixed hazardous waste in RCRA Unit 200."

The RCRA Contingency Plan was initiated on July 20, 1994, as a conservative measure, because of the release from containment to the environment of approximately 1 lb of hazardous waste. Samples were collected from the wet vacuum, the tanker drain hose, and surrounding soils (prior to and after excavation). RCRA CPIR No. 94-009 was filed in response to the incident.

PAC Investigations

Based on historical information regarding the tanker truck release, soil was sampled for radionuclides, metals, VOCs, SVOCs, PCBs, and pH in November 2002, in accordance with IASAP Addendum #IA-02-01 (DOE 2001). Surface soil samples were collected from five locations within PAC 500-907 and these locations and analytical data are presented in the Group 500-7 Data Summary Report (DOE 2003b). There were no analytical results above the RFCA WRW soil ALs. Aroclor-1260 was detected in all five samples with a maximum concentration of 37 µg/kg. SVOCs were detected at low concentrations. Metals, including lead, arsenic, and chromium at maximum concentrations of 67.2 mg/kg, 13.0 mg/kg, and 58.2 mg/kg respectively, were detected.

No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no contaminant source was identified at PAC 500-907. PCOCs for this site were not detected above the RFCA WRW soil ALs (DOE et al. 2003).

DOE received approval of NFAA status for IHSS Group 500-7 on June 9, 2003 from CDPHE (the LRA) (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE, RE: Final Data Summary Report for IHSS Group 500-7, June 9.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Ninth Quarterly Update for the Historical Release Report – July 1, 1994 to September 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2001, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Historical Release Report 2003 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 500-7, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 500-908

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Oil Released from Air Compressor

This Final Update to the HRR for PAC 500-908 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-908 is summarized in this update. The following HRR volumes contain PAC 500-908 information:

Update Report – Twelfth Quarterly (DOE 1995); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

May 15, 1995

Historical Summary

As shown on Figure 19, PAC 500-908 was located near the Nitrogen Plant (Building 223), and is contained within IHSS 156.1 (Building 371 Parking Lot).

At approximately 6:00 P.M. on May 15, 1995, a subcontract employee discovered that the air ejector vent associated with an air compressor inside the Nitrogen Plant was plugged, resulting in a release of 15 gallons of used air compressor oil. Approximately 14 gallons of the used oil was released within the building and 1 gallon may have flowed into the building floor drain before the release was identified. In addition, an estimated 1 gallon of oil was sprayed onto a rock area outside of the building near the northwest corner staining approximately a 6 by 30 ft area (DOE 1995).

Immediately after discovering that the air ejector vent was plugged on May 15, 1995 at 6:00 P.M., the subcontract employee unplugged the external vent, which stopped the release of used oil. On the following day at 12:00 P.M., the oil released within Building 223 was cleaned up using absorbent materials and placed into a single drum. The visibly stained rock and soil released to the environment outside of the building was removed and containerized by 3:45 P.M. that afternoon. Approximately 2,800 lb of rock and 10 lb of soil/mud were removed from the site northwest of the building. Four drums were filled for the cleanup outside of the building and managed as nonhazardous waste. RCRA CIPR 95-003 was filed in response to the incident (DOE 1995).

The used oil released from the air compressor was originally handled as a hazardous waste constituent based upon process knowledge and analytical data gathered from other similar releases of air compressor equipment. However, the analytical screening data from oil, soil, and rock samples collected on May 16, 1995, for select metals and VOCs indicate the levels of toxic

constituents for the material released were well below TCLP regulatory limits and therefore, the used oil and affected soil was not hazardous waste (DOE 1995).

Any used oil that may have entered the Building 223 floor drain was not recoverable and therefore was treated in the Waste Water Treatment Plant process.

PAC Investigations

No further investigation was necessary because no toxic constituents were identified in the oil.

No Further Action Recommendation

PAC 500-908 was recommended for NFA in the HRR Twelfth Quarterly Update on the basis of the small amount of material released to the environment, the immediate cleanup response, and the analytical screening data showing that the spilled material was nonhazardous. There was no evidence of historical contamination found as a result of the release occurring in IHSSs 186 and 156.1 because of the abundance of rock in the area.

Following agency review of the HRR Twelfth Quarterly Update (DOE 1995), DOE received approval of the NFA status for PAC 500-908 from CDPHE and EPA (the LRA) on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

DOE, 1995, Historical Release Report Twelfth Quarterly Update – April 1, 1995 to June 30, 1995, August.

DOE, 2002, Historical Release Report 2002 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from T. Rehder, EPA Region VIII, and S. Gunderson, CDPHE, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

PAC REFERENCE NUMBER: 500-909

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Release of Spent Photographic Fixer Solution

This Final Update to the HRR for PAC 500-909 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 500-909 is summarized in this update. The following HRR volumes contain PAC 500-909 information:

Update Report – 1996 Annual (DOE 1996a); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

April 22, 1996

Historical Summary

As shown on Figure 19, PAC 500-909 is located on the western side of the northern end of Building 551. PAC 500-909 is completely contained within IHSS 158.

At approximately 3:30 P.M. on April 22, 1996, workers discovered that a secondary containment system for a drum had overturned. The drum was used to accumulate spent photographic fixer solution containing 8.8 ppm TCLP silver (RCRA Code D011). The incident occurred on the west side of Building 551. The containment system and drum were immediately righted and the contents of the drum and containment system examined to determine whether a release to the environment had occurred. It was determined that approximately 5 to 6 gallons of the fixer solution had been released to the soil (DOE 1996).

Efforts were initiated within 24 hours to remove a contaminated soils in the immediate area of impact. Approximately one 55-gallon drum of soil was removed and transported to a RCRA Hazardous Waste Management Unit after radiological screening was performed. Two composite soil samples were collected in the area after cleanup. Analytical data confirmed that the contaminated soil had been removed. The excavation was filled with clean fill and the secondary containment system was secured to ensure that the incident would not recur. This incident did not result in any injury or potential hazard to human health or the environment (DOE 1996). RCRA CPIR No. 96-001 was filed in response to this incident (DOE 1996b).

PAC Investigations

No further investigations were performed based on quick spill response and previous soil samples.

No Further Accelerated Action Recommendation

PAC 500-909 was recommended for NFAA designation in the 1996 HRR because of the small amount of material released to the environment, the immediate cleanup response, and the cleanup verification samples showing that the release was adequately remediated. DOE received CDPHE (the LRA) and EPA approval of the NFAA status of PAC 500-909 on February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

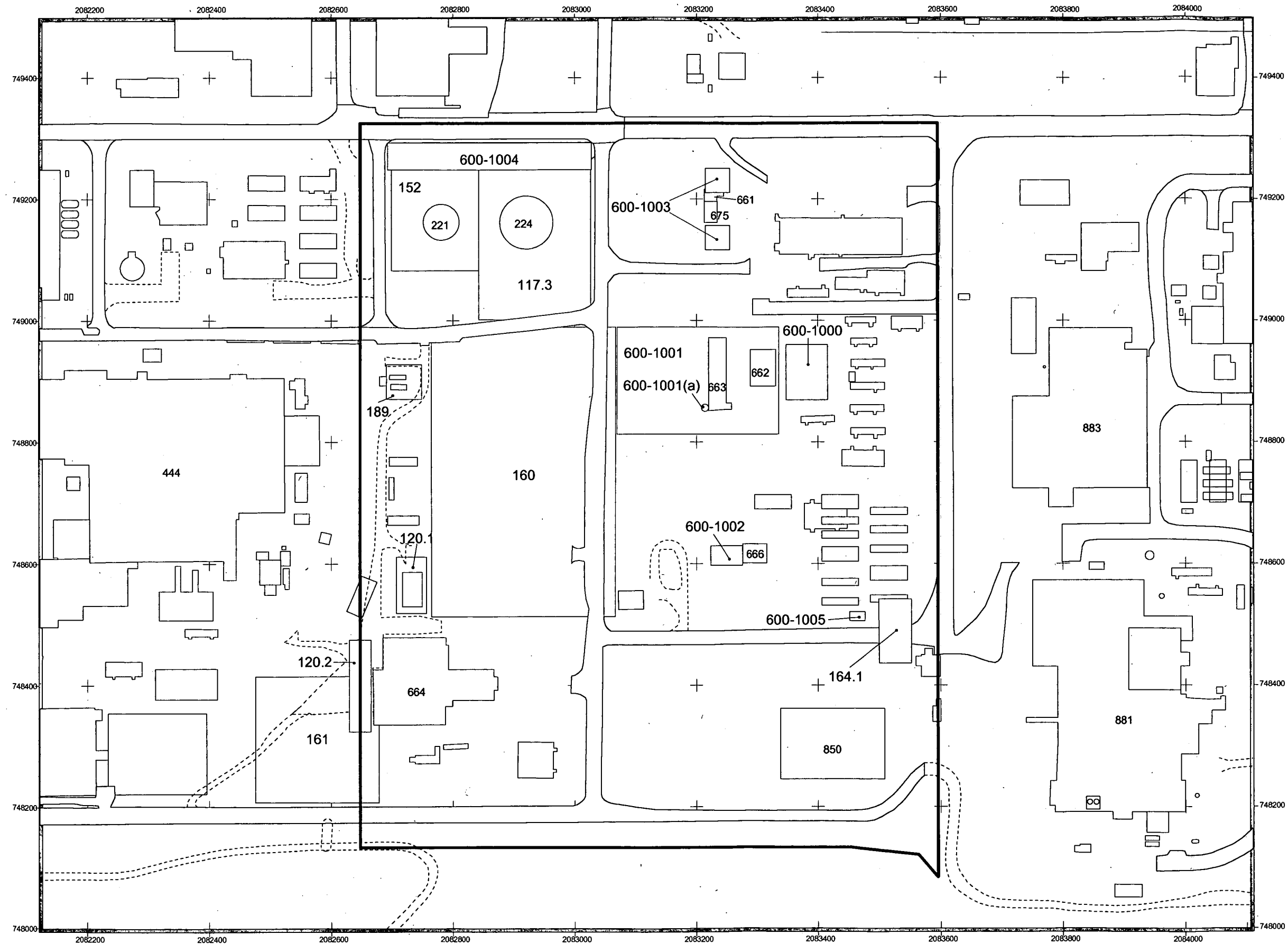
DOE, 1996a, Historical Release Report 1996 Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1996b, RCRA Contingency Plan (CPIR No. 96-001), Rocky Flats Environmental Technology Site, Golden, Colorado, May.


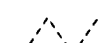
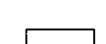
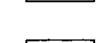
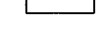


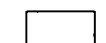
DOE, 2002, Historical Release Report 2002 Annual Update. Rocky Flats Environmental Technology Site, Golden, Colorado, September.

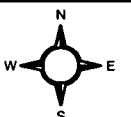
DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachments, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

Figure 20
HRR 600 Area
IHSSs and PACs



KEY

-  Stream
-  Dirt road
-  PAC
-  IHSS
-  HRR area
-  Lake
-  Asphalt
-  Building



150 0 150 Feet

Scale = 1: 2500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 09.28.05



File: W:\Projects\FY2005\HRR Update\Figures\
hrr_600.apr

PAC REFERENCE NUMBER: 600-117.3

IHSS Number: 117.3
Current Operable Unit: IA
Former Operable Unit: 13
IHSS Group: Not Applicable
Unit Name: Chemical Storage - South Site

This Final Update to the HRR for PAC 600-117.3 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 117.3 is summarized in this update. The following HRR volumes contain IHSS 117.3 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

Prior to 1955 to 1966

Historical Summary

The area southwest of the intersection of Central Avenue and Sage Street was used for miscellaneous storage from approximately 1964 until 1969. The location of IHSS 117.3 is shown on Figure 20. Two large No. 6 fuel oil tanks were located in this area. Tank 224, a 1,800,000-gallon capacity tank built in 1973, was located approximately 130 ft southwest of the intersection of Central Avenue and Sage Street. Tank 221, an 800,000-gallon capacity tank built in 1955, was located approximately 70 ft west of Tank 224. Both tanks were demobilized in 1966.

Low-level oblique aerial photographs show miscellaneous materials being stored around Tank 221 from at least 1965 to 1969 (DOE 1992a). Wooden boxes were present south and east of Tank 221 in 1965 and 1966. Drums were apparently stored east of Tank 221 in 1966. In 1969, wooden boxes, reportedly containing contaminated debris from the May 1969 fire in Buildings 776 and 777, were stored east of Tank 221. Later in 1969, the boxes were no longer present.

On May 4, 1965, highly contaminated oil leaked from a glovebox (designated H-22) that was being transferred from Building 776 to IHSS 117.3. The leak occurred within IHSS 117.3, as well as along the last approximately 400 ft of the transport route along Central Avenue. The glovebox, previously used for heat-treating product material, was packaged in a plastic sheet-lined wooden waste box for disposal as excess contaminated property. Approximately 2 to 3 liters escaped from the packaging, contaminating a forklift, a flatbed truck, and a pickup truck, as well as approximately 900 ft² of ground surface in an 18-inch-wide strip (DOE 1992a). Oil spots on the road were monitored at greater than 100,000 cpm by alpha survey instruments (DOE 1992a). The asphalt was removed, placed in lined barrels, and buried in a sludge pit. The soil affected by the leaking glovebox was also removed and drummed, in preparation for off-site disposal. Removal of the soil under the glovebox was completed on May 7, 1965 (DOE 1992a).

It is believed that the referenced "sludge pit," in which the contaminated asphalt was buried, is one of the East Trenches (PACs NE-111.1 through NE-111.8).

On June 15, 1965, a leaking waste box was discovered in the waste storage area south of Building 551. The box was returned to Building 881 for investigation and repackaging. It is likely that the area south of Building 551 was IHSS 117.3 (DOE 1992a). No documentation was found regarding the constituents of the material leaking from the waste box.

IHSS Investigations

Investigations were conducted in IHSS 117.3 in accordance with the Phase I RFI/RI Work Plan for OU 13 (DOE 1992b). Because of their overlap, IHSS 117.3 and PAC 600-152 were investigated as a single site. Twenty-six soil gas samples were collected at a depth of 5 ft and analyzed for VOCs. Trichlorofluoromethane was the only VOC detected, and the highest detection was 8.9 µg/L (DOE 1995a). Soil gas survey data are reported in Table 2 of the narrative for IHSSs 117.3 and 152 in the 1997 Annual Update to the HRR (DOE 1997). Nine surface soil samples were collected and analyzed for radionuclides and metals. Plutonium-239/240 was detected at concentrations greater than background at four locations. The highest detection was 0.385 pCi/g. Lead, selenium, or zinc was detected at concentrations greater than background at five locations. Lead concentrations ranged from 78.5 to 90.6 mg/kg; selenium was detected at 1.5 mg/kg at one location and zinc concentrations ranged from 147 to 1680 mg/kg (DOE 1995a). All results were less than the OU 13 PPRGs and RFCA Tier II soil ALs (DOE et al. 1996). Results for this investigation are summarized in Table 1 of the 1997 Annual Update to the HRR (DOE 1997).

No Further Action Recommendation

IHSS 117.3 was recommended for NFA status in the 1997 Annual Update to the HRR (DOE 1997) for the following reasons:

- Comparison of IHSS 117.3 sampling results to the RFETS PPRGs (DOE 1995b) and with RFCA soil ALs (DOE et al. 1996) indicated results were less than the applicable PPRGs and RFCA Tier II soil ALs (DOE et al. 1996) (see Table 1 of the narrative for IHSSs 117.3 and 152 in the 1997 Annual Update to the HRR).
- Application of the CDPHE conservative screen in accordance with RFCA (DOE et al. 1996) showed that both the total carcinogenic ratio and the total noncarcinogenic ratio sums were below the level of concern (ratio sum >1) (see Tables 3 and 4 of the narrative for IHSSs 117.3 and 152 in the 1997 Annual Update to the HRR).

DOE received approval of NFA status for IHSS 117.3 from CDPHE (the LRA) on July 9, 1999 (CDPHE 1999).

Comments

Materials similar to those stored at IHSS 117.3 were also stored south of Tank 221, in the Building 444 parking lot (PAC 600-160).

References

CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: Annual Update for the Historical Release Report (September 1997), July 9.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Phase I RFI/RI Work Plan 100 Area OU 13, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995a, Draft Data Summary 2, Operable Unit 13, 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1995b, Programmatic Risk-Based Preliminary Remediation Goals, Final Revision #3, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 600-120.1

IHSS Number: 120.1
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 600-3
Unit Name: Fiberglass Area North of Building 664

This Final Update to the HRR for PAC 600-120.1 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 120.1 is summarized in this update. The following HRR volumes contain IHSS 120.1 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1972 to 1979

Historical Summary

The location for IHSS 120.1 is shown on Figure 20. IHSS Group 600-3 (which is comprised solely of IHSS 120.1) consists of the area beneath and around Building 668 where waste packing boxes were coated with fiberglass. Building 668, located north of Building 664, was a wooden-framed structure with deteriorating walls constructed of transite panels over a single concrete slab. Fiberglass activities occurred in the area from 1972 to 1979. The fiberglass process may have resulted in spills of polyester resin, peroxide catalyst materials, and cleaning solvents, even though there is no documentation of spills in this area (DOE 1992). The Building 668 structure and slab were removed in January 2004 (DOE 2004b).

The Aerial Radiological Measurements System survey, conducted in 1977, detected elevated gamma radiation and americium activities in the vicinity of this site. No documentation was found that provided an explanation for the origin of the elevated readings (DOE 1992).

Persons interviewed for the CEARP Phase 1 report indicated the area may contain residue from spills of polyester resin, peroxide catalyst materials, and cleaning solvents. Plutonium- and uranium-contaminated liquid and solid wastes staged in Building 664 are the likely source for the elevated radiation readings in 1977 (DOE 1992).

IHSS Investigations

IHSS 120.1 was investigated in accordance with the OU 12 RFI/RI Work Plan (DOE 1992b). OU 12 data are summarized in the IA Data Summary Report (DOE 2000). Sixteen surface soil samples were collected from in and around IHSS 120.1. Plutonium-239/240 was detected at a maximum activity of 0.67 pCi/g and americium-241 was detected at a maximum of 0.135 pCi/g. These values are less than the applicable RFCA WRW soil ALs (DOE et al. 2003). Beryllium was detected at a maximum of 0.61 mg/kg, and cadmium was detected at a maximum of 7.8 mg/kg, both of which are below the RFCA WRW soil ALs (DOE et al. 2003). Copper, iron,

lithium, manganese, and zinc were detected at concentrations greater than background values, but well below RFCA WRW soil ALs (DOE et al. 2003). Based on these data and historical information, radionuclides, metals, VOCs, and SVOCs were considered PCOCs for IHSS 120.1.

In accordance with RFCA (DOE et al. 1996) IASAP Addendum #IA-04-05 for IHSS 120.1 (DOE 2003), 16 surface and subsurface soil characterization samples were collected at eight locations between December 10, 2003 and January 20, 2004. Uranium-234, uranium-235, and uranium-238 were detected in surface soil at maximum activities of 4.7, 0.212, and 2.17 pCi/g, which are greater than background values but less than the RFCA WRW soil ALs (DOE et al. 2003). Copper, iron, manganese, and zinc were the only metals detected in surface soil, again at concentrations less than the RFCA WRW soil ALs. The maximum detection of copper in surface soil was 19 mg/kg, and the maximum concentration of zinc was 80 mg/kg. All concentrations of metals in soil were significantly below the RFCA WRW soil ALs (DOE et al. 2003). SVOCs were detected in surface soil, but at concentrations significantly less than the RFCA WRW soil ALs. Plutonium-239/240 was detected in subsurface soil at a maximum activity of 0.126 pCi/g, which is less than the RFCA WRW soil AL of 50 pCi/g. Uranium-234, uranium-235, and uranium-238 were detected in subsurface soil at activities greater than background values, but much less than the RFCA WRW soil ALs (DOE et al. 2003). No metals were detected in subsurface soil. Acetone and methylene chloride, along with SVOCs, were detected in surface soil but at concentrations significantly less than the RFCA WRW soil ALs. Analytical results from the characterization sampling are presented in the Data Summary Report for IHSS Group 600-3 (DOE 2004b).

No Further Action Recommendation

Based on analytical results and the SSRS, an NFAA determination was justified for IHSS 120.1 in the 2004 Annual Update to the HRR (DOE 2004a) because of the following:

- There are no RFCA WRW soil AL exceedances at IHSS 120.1.
- Migration of contamination to surface water through erosion is unlikely because this IHSS Group is not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS 120.1.

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 120.1 on May 12, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: Data Summary Report for IHSS Group 600-3 (B668) - Approval, May 12.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final RFI/RI Work Plan – 400-800 Area – Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September.

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-04-05, IHSS Group 600-3, IHSS 120.1, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 600-3, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-120.2

IHSS Number: 120.2
Current Operable Unit: IA
Former Operable Unit: 12
IHSS Group: 400-10
Unit Name: Fiberglassing Area West of Building 664

This Final Update to the HRR for PAC 600-120.2 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 120.2 is summarized in this update. The following HRR volumes contain IHSS 120.2 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1972 to 1979

Historical Summary

Fiberglassing of waste-packing boxes occurred in the areas north and west of Building 664 during the 1970s. Interviewees for the CEARP indicated that a spill of polyester resin might have occurred west of Building 664 during 1978 or 1979. Foam was sprayed on the ground, indicating something was being contained. Interviewees also recalled fiberglass and epoxy components, as well as solvents, being spilled west and north of Building 664. The location for IHSS 120.2 is shown on Figure 20.

The Aerial Radiological Measurements System survey, conducted in 1977, detected elevated gamma radiation and americium concentrations in the vicinity of these sites. Plutonium- and uranium-contaminated liquid and solid wastes staged in Building 664 are the likely constituents that led to the elevated radiation readings in 1977.

IHSS Investigations

IHSS 120.2 was investigated in accordance with the Final RFI/RI Work Plan for OU 12 (DOE 1992b). OU 12 analytical data are presented in the IA Data Summary Report (DOE 2000). Twelve surface soil samples were collected and analyzed for radionuclides and metals. Americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238 were detected at activities greater than background values, but significantly less than RFCA Tier II soil ALs (DOE et al. 1996). The maximum americium-241 activity detected was 0.048 pCi/g and the maximum plutonium-239/240 activity was 4.414 pCi/g. The maximum activities of uranium-234, uranium-235, and uranium-238 were 2.422, 0.579, and 2.53 pCi/g, respectively. Detected metals included beryllium at 8.4 mg/kg, cadmium at 11.4 mg/kg, chromium at 28.2 mg/kg, copper at 70 mg/kg, and zinc at 368 mg/kg. Soil gas samples indicated that acetone, benzene, toluene, methane, ethylbenzene and total xylenes were detected at concentrations greater than 1 µg/L. Methane had the highest detection a 390 µg/L (DOE 2000).

Based on historical sampling results and information, subsurface soil samples were collected from three locations targeting metals, radionuclides, SVOCs, and VOCs in accordance with IASAP Addendum #IA-02-01 (DOE 2002). Acetone, methylene chloride, toluene, and 2-butanone were detected at concentrations only slightly higher than the detection limit. All results were less than RFCA WRW soil ALs (DOE et al. 2003). Analytical results from the characterization sampling are presented in the Data Summary Report for IHSS Group 400-10 (DOE 2003b).

No Further Action Recommendation

Based on analytical results and the SSRS, an NFAA determination was justified for IHSS 120.2 in the Data Summary Report because of the following:

- All contaminant concentrations were less than RFCA Tier II soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003).
- There was no identified potential to exceed surface water standards from contaminants at IHSS 120.2.

DOE received approval of NFAA status for IHSS 120.2 from CDPHE (the LRA) on July 15, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE; Re: Final Data Summary Report for IHSS Group 400-10, July 15.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final RFI/RI Work Plan – 400-800 Area – Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September.

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Characterization Data Summary Report for IHSS Group 400-10, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-152

IHSS Number: 152
Current Operable Unit: Not Applicable
Former Operable Unit: 13
IHSS Group: Not Applicable
Unit Name: Fuel Oil Tank 221 Spills (PAC 600-152)

This Final Update to the HRR for PAC 600-152 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 152 is summarized in this update. The following HRR volumes contain IHSS 152 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

Prior to 1955 to 1966

Historical Summary

Tank 221 was an 800,000-gallon surface-mounted storage tank located east of Building 452. Tank 221 began operation in 1955 and contained No. 6 fuel oil. Tank 224, also used for No. 6 fuel oil, was located directly east of Tank 221 and had a 1,800,000-gallon capacity. Spills and releases from these fuel oil tanks resulted in the formation of IHSS 152 (DOE 1992a). IHSS 152 overlaps with PAC 600-117.3. The location of IHSS 152 is shown on Figure 20.

On January 29, 1971, 700 gallons of No. 6 fuel oil leaked from Tank 221 because the fill line valve, which was used to transfer oil from transport trucks to the tank, had not been closed after use. Reportedly, the released oil was confined to ditches and an open field east of the tank. Documentation on the incident indicates that this was the second incident of this nature in four weeks. In response to this occurrence, ditches and ponds were dug to prevent the spread of contamination. The oil was scraped up and disposed on the Present Landfill (PAC NW-114) (DOE 1992a).

On April 4, 1975, a leak was discovered in the heater coil of one of the fuel oil tanks when the pressure dropped below the head pressure of oil in the tank. The leak enabled oil to flow through the condensate drain line and into the diked area around the tank. The area was cleaned up at a cost of \$4,680 (DOE 1992a).

During the week ending February 16, 1979, an estimated 400 gallons of No. 6 fuel oil was spilled during the filling of the Central Avenue storage tanks. During the week ending February 17, 1989, approximately 50 gallons of No. 6 fuel oil were released when a valve was left open. Reportedly, the oil did not enter a water course (DOE 1992a).

IHSS Investigations

Investigations were conducted at IHSSs 117.3 and 152 as part of the OU 13 RFI/RI in accordance with the Phase I RFI/RI Work Plan for OU 13 (DOE 1992b). The two IHSSs were considered a single source because of their overlap and proximity. Fifty-five soil gas samples were collected at a depth of 5 ft and analyzed for VOCs. Trichlorofluormethane was detected in a number of locations. The highest detection was 31 µg/L. Benzene and vinyl chloride were detected in very small amounts at one location. Eleven surface soil samples were collected and analyzed for radionuclides and metals. Plutonium-239/240, uranium-233/234, or uranium-238 were detected at concentrations greater than background at six locations. The highest plutonium-239/240 detection was 0.385 pCi/g. Uranium-233/234, detected at two locations, ranged from 2.09 to 2.26 pCi/g, and uranium-238 was detected at 1.95 pCi/g at one location. Cobalt, lead, selenium, or zinc was detected at concentrations greater than background at seven locations. Cobalt was detected at one location at 53.5 mg/kg. Lead concentrations ranged from 78.5 to 90.6 mg/kg; selenium was detected at 1.5 mg/kg at one location, and zinc concentrations ranged from 147 to 1680 mg/kg (DOE 1995a). All results were less than the OU 13 PPRGs and RFCA Tier II soil ALs (DOE et al. 1996). Data for IHSS 152 are reported in the narrative for IHSSs 117.3 and 152 in the 1997 Annual Update to the HRR (DOE 1997).

No Further Action Recommendation

IHSS 152 was recommended for NFA status in the 1997 Annual Update to the HRR (DOE 1997) for the following reasons:

- Comparison of IHSS 152 sampling results to the RFETS PPRGs (DOE 1995b) and RFCA Tier II soil ALs (DOE et al. 1996) showed these data were less than both the applicable PPRGs and Tier II soil ALs (see Table 1 of the narrative for IHSS 152 in the 1997 Annual Update to the HRR).
- Application of the CDPHE conservative screen in accordance with RFCA (DOE et al. 1996) showed that both the total carcinogenic ratio and the total noncarcinogenic ratio sums are below the level of concern (ratio sum <1) (see Tables 3 and 4 of the narrative for IHSS 152 in the 1997 Annual Update to the HRR).

DOE received approval of NFA status for IHSS 152 from CDPHE (the LRA) on July 9, 1999 (CDPHE 1999).

Comments

None

References

CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: Annual Update for the Historical Release Report (September 1997), July 9.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan – 100 Area – Operable Unit 13, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995a, Draft Data Summary 2, Operable Unit 13, 100 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1995b, Programmatic Risk-Based Preliminary Remediation Goals, Final Revision #3, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 600-160

IHSS Number: 160
Current Operable Unit: IA
Former Operable Unit: 14
IHSS Group: 600-4
Unit Name: Radioactive Site – 444 Parking Lot

This Final Update to the HRR for PAC 600-160 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 160 is summarized in this update. The following HRR volume contains IHSS 160 information:

Original Report – 1992 (DOE 1992a)

Dates(s) of Operation or Occurrence

Prior to 1959 to 1971

Historical Summary

IHSS 160 contains the Building 444 parking lot and a section of Seventh Avenue located east of Building 444. The location for IHSS 160 is shown on Figure 20. The Building 444 parking lot was paved, but the area had previously been unpaved when it was used to store wastes prior to off-site disposal. The actual date of paving is uncertain, but it is likely that paving operations were undertaken when the storage area became a parking lot. Aerial photographs taken in June 1965 and June 1969 show drums and boxes in the unpaved area that is associated with IHSS 160 (DOE 1992).

Two retired employees interviewed for the original HRR (DOE 1992) stated that the area now occupied by the Building 444 parking lot had been used for the storage of drummed and boxed waste; in particular, waste resulting from the May 1969 fire in Building 776 and Building 777. Uranium- and plutonium-contaminated oils and coolants were reportedly stored here in great quantity. In the early 1970s, surface soil was removed from this area; however, Rocky Flats personnel interviewed for CEARP Phase I mentioned that small amounts of plutonium may have remained.

On May 24, 1971, two boxes leaked an unknown contaminated liquid onto the ground at the waste box storage yard. Approximately 1,000 ft² of ground were contaminated from 1,000 cpm to greater than 100,000 cpm. The quantity of released liquid was not documented. Apparently the leaks were due to rain or melting snow entering the boxes. The boxes were returned to Building 777. On June 16, 1971, decontamination activities at the waste box storage yard were completed.

Results of an alpha probe survey at the waste storage yard east of Building 444 in February 1973 indicated that no contamination was detected (DOE 1992).

IHSS Investigations

IHSS 160 was investigated in accordance with the Phase I RFI/RI Work Plan for OU 14 (DOE 1992b). The OU 14 Draft Data Summary (DOE 1995) presented results of the investigation. Fifty-six surface soil samples were collected within the boundaries of IHSS 160 on a grid with 50-ft spacing. Subsurface soil samples were also collected at four boreholes ranging from 4.6 to 27.5 ft bgs in the southern portion of IHSS 160, and one 24-ft borehole in the northeastern portion of the IHSS along its eastern border. Surface soil samples were analyzed for metals and radionuclides, and subsurface soil samples were analyzed for VOCs and metals. Plutonium was detected above background means plus two standard deviations in 75 percent of the surface soil samples. Plutonium-239/240 was detected at three times the RFCA WRW soil AL (DOE et al. 2003) at one location, SS441294 at an activity of 150 pCi/g. This is the only historical exceedance identified in IHSS 160. Copper, lead, and zinc concentrations exceeded background means plus two standard deviations in approximately 20 percent of the surface soil samples. The maximum concentrations are 50.2, 426, and 314 mg/kg, respectively. Chlorinated solvents, including 1,1,1-trichloroethane, 1,2-dichloroethane, and tetrachloroethene, were detected in subsurface soil in the northeastern portion of IHSS 160. There were sporadic detections of VOCs in subsurface soil in the southern part of IHSS 160, chiefly methylene chloride and carbon disulfide. All detections of VOCs were four to eight orders of magnitude less than the RFCA WRW soil ALs (DOE 1995; DOE et al. 2003).

Characterization samples were collected at IHSS 160 as part of RFCA (DOE et al. 1996) accelerated action activities for IHSS Group 600-4 in accordance with IASAP Addendum #IA-03-09 (DOE 2003). One hundred and twenty-six surface and 194 subsurface soil samples were collected. Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. Eighteen samples were analyzed for PCBs. Contaminant concentrations in soil greater than RFCA WRW soil ALs at IHSS Group 600-4 were limited to plutonium-239/240 in surface soil at one sampling location (CA37-013), and arsenic in subsurface soil at two sampling locations (CB37-000 and CB38-003). The maximum plutonium-239/240 activity was 183.77 pCi/g. Aroclor-1254 was detected at one location at a concentration of 27 µg/kg. Arsenic was detected in subsurface soil at a maximum concentration of 26 mg/kg. Based on the SSRS, the subsurface soil exceedances of arsenic at sampling locations CB37-000 and CB38-003 did not require remediation (DOE 2004a).

Surface soil at sampling locations CA37-013 and SS441294 required remediation because plutonium-239/240 activities in subsurface soil collected at these locations were more than three times the RFCA WRW soil AL (DOE et al. 2003).

Notification of the planned RFCA accelerated action (DOE et al. 1996) was provided in ER RSOP Notification #04-20 (DOE 2004b). Activities were conducted between July 8 and December 8, 2004, and involved removal of soil from two hot-spot locations. At sampling location CA37-013, soil was excavated to a depth of approximately 2 ft bgs and approximately 2.5 ft laterally to the east, west, and south, and approximately 5 ft to the north. At historical sampling location SS441294, soil was excavated to a depth of approximately 1 ft bgs and approximately 8 ft laterally in a north-south direction, and 16 ft laterally in an east-west direction. Six confirmation soil samples were collected from each excavation and analyzed. All radionuclide activities in confirmation samples were less than the RFCA WRW soil ALs (DOE et al. 2003) based on analysis by alpha spectroscopy. Residual plutonium-239/240 activities

ranged from 0.161 to 4.83 pCi/g in confirmation samples. Details and analytical results are provided in the Final Closeout Report for IHSS Group 600-4 (DOE 2004a).

No Further Action Recommendation

Results from confirmation sampling indicate that plutonium-239/240 levels were remediated to below the RFCA WRW soil AL (DOE et al. 2003) at the two excavated hot spots. Residual contamination exceeding RFCA WRW soil ALs (DOE et al. 2003) is limited to arsenic in subsurface soil at two sampling locations. Based on application of the hot-spot methodology and the SSRS, soil at these arsenic locations does not require accelerated action.

IHSS 160 was recommended for NFAA status in the Closeout Report for IHSS Group 600-4 (DOE 2004a) for the following reasons:

- All ER RSOP RAOs (DOE 2003) and remediation goals established for remediation of IHSS 160 soil were achieved. Soil with plutonium-239/240 contamination was removed.
- All residual contaminant activities and concentrations in surface soil are less than WRW soil ALs.
- The SSRS and stewardship evaluations indicated no additional accelerated action is required.

DOE received approval of NFAA status for IHSS 160 from CDPHE (the LRA) on December 23, 2004 (CDPHE 2004).

Comments

None

References

CDHPE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: Approval, Draft Closeout Report for IHSS Group 600-4, IHSS 160 – Radioactive Site, Building 444 Parking Lot, December 23.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan Operable Unit 14 Radioactive Waste Sites, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995, Draft Data Summary 1, Operable Unit No. 14, Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-09, IHSS Group 600-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004a, Closeout Report for IHSS Group 600-4, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #04-20, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-161

IHSS Number: 161
Current Operable Unit: IA
Former Operable Unit: 14
IHSS Group: 400-10
Unit Name: Radioactive Site – Building 664

This Final Update to the HRR for 600-161 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 161 is summarized in this update. The following HRR volumes contain IHSS 161 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1971 to 2002

Historical Summary

Building 664 was constructed in 1971 and was used to stage drummed and boxed waste prior to off-site shipment for disposal. The location of IHSS 161 is shown on Figure 20. Persons interviewed for the CEARP Phase 1 report indicated the area west of Building 664 may have had low-level residual contamination from plutonium and uranium resulting from punctured or leaking drums and boxes of solid and liquid wastes. Soil was reportedly removed from this area in the early 1970s; however, no documentation was found that provides details of soil remediation activities (DOE 1992a).

Results of an aerial radiological survey conducted in 1977 indicate an area of elevated americium and gamma activity concentrations centered around the area of the northwest corner of Building 664. Plutonium- and uranium-contaminated liquid and solid wastes staged in Building 664 are the likely constituents that led to the elevated radiation readings in 1977 (DOE 1992a).

In November 1988, a forklift leaked hydraulic oil outside Building 664. The cause was a rupture of a 1-inch hose on the forklift. The oil spread over the asphalt area and adjacent ground. An oil absorbent was spread over the oil that remained from the November 1988 incident (DOE 1992a).

IHSS Investigations

IHSS 161 was studied in accordance with the Phase I RFI/RI Work Plan for OU 14 (DOE 1992b). Thirty surface soil locations were sampled and analyzed for radionuclides. Plutonium-239/240, uranium-234, uranium-235, and uranium-238 were detected at maximum activities of 20.57, 2.422, 0.579, and 5.693 pCi/g, respectively. Detailed results are presented in the Draft OU 14 RFI/RI report (the final report was not completed) (DOE 1995).

Forty-six subsurface soil locations were sampled for IHSS 161 as part of RFCA (DOE et al. 1996) accelerated action activities for IHSS Group 400-10 in accordance with IASAP Addendum #IA-02-01 (DOE 2002). Samples were analyzed for metals, radionuclides, SVOCs, and VOCs.

Surface soil samples were not collected because sufficient surface soil samples were collected as part of the OU 14 RFI/RI (DOE 1995). Results indicated uranium-235 and uranium-238 were detected at activities slightly greater than background values, but less than RFCA WRW soil ALs (DOE et al. 2003) in subsurface soil. Maximum activities for uranium-235 and uranium-238 were 0.35 and 5.74 pCi/g, respectively. Acetone, 2-butanone, methylene chloride, naphthalene, and toluene were detected at concentrations close to detection limits. Metals detected at concentrations greater than background values, but less than RFCA WRW soil ALs (DOE et al. 2003) were aluminum at 48,000 mg/kg, arsenic at 21.6 mg/kg, cobalt at 38.1 mg/kg, lead at 63.8 mg/kg, and strontium at 214 mg/kg. As shown in the Data Summary Report (DOE 2003b), analytical results for all analytes are less than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

IHSS 161 was recommended for NFAA status in the Data Summary Report (DOE 2003b) for the following reasons:

- All contaminant concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- There is no identified potential to exceed surface water standards.

DOE received approval of NFAA status for IHSS 161, from CDPHE (the LRA) on July 15, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE; Re: Final Data Summary Report for IHSS Group 400-10, July 15.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan Operable Unit 14 Radioactive Waste Sites, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995, Draft Data Summary 1, Operable Unit No. 14, Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 400-10, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-164.1

IHSS Number: 164.1
Current Operable Unit: IA
Former Operable Unit: 14
IHSS Group: Not Applicable
Unit Name: Radioactive Slab from Building 771

This Final Update to the HRR for PAC 600-164.1 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 164.1 is summarized in this update. The following HRR volumes contain IHSS 164.1 information:

- Original Report – 1992 (DOE 1992a);
- Update Report – 1997 Annual (DOE 1997);
- Update Report – 2000 Annual (DOE 2000);
- Update Report – 2001 Annual (DOE 2001); and
- Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

September 1957

Historical Summary

After the 1957 fire in Building 771, a radioactively contaminated slab from the east wall of the building was placed in an area northwest of Building 881 for temporary storage. The slab was originally documented in the HRR (DOE 1992a) as coming from Building 776. That origin is almost certainly in error because Building 776 first came online in 1957, and there are no identified fires related to Building 776 in 1957 (DOE 1992a). The location for IHSS 164.1 is shown on Figure 20.

The slab was reportedly broken up and removed, and the area cleaned (DOE 1992a). Several hundred square feet of ground surface were considered to be impacted. The area was later covered by the southeastern corner of the Building 881 parking lot. In the 1992 HRR, IHSS 164.1 was placed in the southeastern section of the 600 Area, in the 881 parking lot (DOE 1992a). This was the area investigated for the OU 14 RFI/RI (DOE 1995).

No documentation was found that detailed the constituents released to the environment. However, because the concrete slab was supposed to have originated from a plutonium processing facility (Building 771), it is possible that the slab was contaminated with plutonium (DOE 1992a).

IHSS Investigations

IHSS 164.1 was studied in accordance with the Phase I RFI/RI Work Plan for OU 14 (DOE 1992b). Results are reported in the OU 14 Phase I Draft RFI/RI Report (a final report was not completed) (DOE 1995). 15 surface soil samples were collected and analyzed for radionuclides within IHSS 164.1. Isotopic analyses of these samples indicate that soil activities are consistent

with background levels and any potential contamination associated with the slab was effectively cleaned up. The activity of plutonium-239/240 exceeded the background mean plus two standard deviations in only one of the 15 samples analyzed. The maximum detected activity of plutonium-239/240 0.076 pCi/g. Locations and analytical results for these samples are provided in Table 2.4 of the 2000 Annual Update to the HRR (DOE 2000).

No Further Action Recommendation

IHSS 164.1 was recommended for NFA in the 2000 Annual Update to the HRR, consistent with the NFA criteria in RFCA (DOE et al.1996), based on the following:

- All analytical data for the OU 14 RFI/RI were collected in accordance with an approved workplan/SAP.
- All analyses were below RFCA Tier II soil ALs (DOE et al. 1996) and at or below established background levels for radionuclides.
- No current or potential source of contamination was identified.

IHSS 164.1 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for IHSS 164.1 because investigations did not identify any evidence of a release associated with this IHSS. An NFA was verbally agreed to in the November 14, 2001 meeting and formally approved in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final Phase I RFI/RI Work Plan Operable Unit 14 Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary 1, Operable Unit No. 14, Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 600-189

IHSS Number: 189
Current Operable Unit: Not Applicable
Former Operable Unit: 12
IHSS Group: Not Applicable
Unit Name: Nitric Acid Tanks

This Final Update to the HRR for PAC 600-189 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 189 is summarized in this update. The following HRR volumes contain IHSS 189 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2000 Annual (DOE 2000); and
Update Report – 2001 Annual (DOE 2001).

Dates(s) of Operation or Occurrence

1952 to 1996

Historical Summary

IHSS 189 is the former location of the 218 Acid Tanks, also referenced as the Building 218 Acid Farm. The location for IHSS 189 is shown on Figure 20. Prior to their removal in 1996, the tanks were located adjacent to the railroad tracks east of Building 444 and south of Cottonwood Avenue. The tanks were used for storing nitric acid from 1952 to 1996 for Buildings 771 and 883 (DOE 1992a). The tanks were designed with secondary containment in the form of 4-inch-thick concrete walls, approximately 4 ft in depth.

On October 27, 1982, a brown cloud of gas was observed coming from the Acid Tank Farm. No documentation was found explaining the incident (DOE 1992a). An overflow occurred on September 25, 1985, during a filling operation. No documentation could be found pertaining to the quantity of acid released, but two containers of sodium bicarbonate were used to neutralize the September 1985 spill (DOE 1992a).

On June 28, 1986, the level probe in a dumpster tank failed, causing a release of nitric acid to the safety overflow and onto the ground. Approximately 1 gallon of acid was released to the ground surface. However, the Fire Department washed down, diluted, and neutralized the acid with sodium bicarbonate (DOE 1992a).

IHSS Investigations

IHSS 189 was investigated in accordance with the OU 12 RFI/RI Work Plan (DOE 1992b). Surficial soil sampling was conducted at six locations surrounding the former tank area. Samples were analyzed for radionuclides, metals, pesticides, PCBs, and pH (DOE 1995). Pesticides and PCBs were not detected. Chromium and mercury were detected at concentrations greater than background, but less than applicable PRGs. The maximum chromium concentration

was 26.1 mg/kg and the maximum mercury concentration was 0.27 mg/kg. Radionuclides were detected at activities very close to background values. Americium-241 was detected at a maximum activity of 0.067 pCi/g and plutonium-239/240 was detected at a maximum activity of 0.551 pCi/g. Uranium-238 had the highest activity at 6.239 pCi/g (DOE 1995). Values for pH ranged from 7.15 to 8.33. Sample locations and sample results are presented on Figure 2-10 and in Table 2.21 of the 2001 Annual Update to the HRR (DOE 2001). The acid tanks were removed on September 29, 1996 (DOE 1997).

No Further Action Recommendation

Based on the results of the soil samples collected at IHSS 189, no current or potential contaminant source was identified.

IHSS 189 was proposed for NFA in the 1997 Annual Update to the HRR (DOE 1997) based upon the health effects and exposure scenario. The 2001 Annual Update to the HRR (DOE 2001) provided analytical results (including soil pH values of between 7.16 and 8.33) to supplement the NFA proposal.

IHSS 189 was addressed through the consultative process in an NFA Working Group meeting on January 1, 2002. An NFA was justified because no current or potential contaminant source was identified for IHSS 189. An NFA was verbally agreed to in the January 1, 2002 meeting and formally approved by CDPHE (the LRA) in a letter dated September 26, 2002 (CDPHE 2002).

Comments

None

References

CDPHE, 2002, Correspondence to J. Legare, DOE RFPO, from S. Gunderson, CDPHE; RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1992a, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1992b, Final RFI/RI Work Plan – 400-800 – Operable Unit 12, Rocky Flats Plant, Golden, Colorado, September.

DOE, 1995, Technical Memorandum No. 2, Operable Unit 12, 400/800 Areas, Vol. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 600-1000

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Storage Outside Building 662

This Final Update to the HRR for PAC 600-1000 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of PAC 600-1000 is summarized in this update. The following HRR volumes contain PAC 600-1000 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to August 1982 through August 1986

Historical Summary

Transformers were stored on the eastern side of Building 662 at the location shown on Figure 20. The boundaries of the original PAC location were estimated. For the 2004 annual update to the HRR, the boundaries were revised based on sampling location surveys and field reconnaissance.

The first indication of transformer storage outside Building 662 is a photograph dated August 1982. There were approximately 10 pole-mounted transformers located on the eastern side of the building (DOE 1992).

From June to October 1983, a large PCB-containing transformer was stored in a catch basin outside Building 662. On October 13, 1983, the transformer was shipped off site for disposal. Neither the condition of the transformer nor the PCB content of the transformer oil is known.

During an inspection on January 30, 1986, EPA audited the electrical yard outside of Building 662 and found 28 pole-mounted transformers stored for reuse. One of the transformers was found to be leaking at that time. The PCB content of the leaking oil was then unknown, but the oil was later determined to contain greater than 500 ppm PCBs. Documentation of the inspection indicates, because of their age or condition, 10 of the 28 transformers were awaiting disposal rather than reuse. Subsequent to the discovery of the leaking transformer, the transformer was disposed as PCB waste (DOE 1992).

PAC Investigations

Table 2-1 of the Closeout Report for the Source Removal of PCBs provides pre-remediation soil and concrete PCB levels (DOE 1997) for PAC 600-1000. Twenty-four concrete samples were analyzed and results indicated that the concrete was not contaminated. Concrete was removed and disposed in the Present Landfill (IHSS NW-114). In accordance with the PAM (DOE 1995), 85.1 cy of PCB-contaminated soil were removed from the eastern side of Building 662,

containerized, and disposed in July 1996. Seventy-five soil samples were analyzed using immunoassay Method 4020 and 17 soil samples were analyzed using Method 8080. PCB levels remaining in the soil were less than 25 ppm using EPA Method 8080.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site remediation and confirmation data, and the White Paper findings noted above, NFAA was proposed for PAC 600-1000 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PACs) Sites (as proposed in 1996 HRR) (DOE 2004c).

After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the lead agency) on the NFAA status for PAC 600-1000 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for the Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PACs) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-1001

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 600-1
Unit Name: Temporary Waste Storage Building 663

This Final Update to the HRR for PAC 600-1001 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 600-1001 is summarized in this update. The following HRR volumes contain PAC 600-1001 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

May 1954 to 1971

Historical Summary

The location for PAC 600-1001 is shown on Figure 20. Two temporary buildings were constructed on concrete slabs for use during the initial Plant construction in the early 1950s. These buildings were located near to where Buildings 662 and 663 were later located. The wooden structures were removed prior to 1954; however, the concrete slabs remained. The slabs from Buildings 662 and 663, as well as the area around them, were used for storage (DOE 1992).

Storage operations began in May 1954, when 302 drums of graphite and 49 drums of liquid waste were placed on the Building 663 slab. Waste coolant drums were also stored on the slab. In November 1954, all of the drums were removed from the slab; however, storage at the area later resumed. Most of the waste stored on this slab came from Buildings 334 and 444 (DOE 1992).

The area was an advantageous loading area, and the slab east of Building 663 was connected to a loading facility. The northern end of the loading facility was reinforced and refinished with concrete in October 1958 (DOE 1992).

On October 15, 1960, a waste storage building was erected on the Building 663 slab. Accumulated drums of waste from the production buildings were moved to the building. In November 1962, drums and boxes of waste from Buildings 771 and 774 were moved to the western side of Building 663 for outside storage (DOE 1992).

Documented releases of radionuclides, oil, coolant, perclene, and acids that occurred at these storage areas are described in the 2003 annual update to the HRR (DOE 2003a) and Appendix C of the IASAP (DOE 2001a).

PAC Investigations

A RFCA accelerated action (DOE et al. 1996) was conducted at IHSS Group 600-1 (PAC 600-1001) between August 5 and October 10, 2002, in accordance with IASAP Addendum #IA-02-01 (DOE 2001b) and ER RSOP Notification #02-04 (DOE 2002a). PCOCs at IHSS Group 600-1 (PAC 600-1001) were determined to be radionuclides, metals, and SVOCs in surface and subsurface soils and VOCs in subsurface soils. Forty surface and subsurface soil samples were collected at PAC 600-1001. Results at one location beneath the Building 663 slab, where the concrete was cracked, indicated plutonium-239/240 activities of 3,600 pCi/g. Soil at this location was excavated to a depth of 4.5 ft over an approximately 20 ft by 30 ft area. Several in-process confirmation samples were collected and two confirmation samples were collected and analyzed. Only two final confirmation samples were collected in this small excavation because the in-process samples had already confirmed that soil removal was complete (DOE 2003b). Confirmation samples indicated all plutonium-239/240 results were less than RFCA Tier II soil ALs (DOE et al. 1996) and proposed RFCA WRW soil ALs (DOE et al. 2003). The maximum residual plutonium-239/240 activity was 17.1 pCi/g. In addition to remediating the contaminated soil, the Building 662 and 663 slabs and a number of smaller slabs were removed and disposed (DOE 2003b).

No Further Action Recommendation

An NFAA for PAC 600-1001 was justified in the Closeout Report for IHSS Group 600-1 (DOE 2003b), based on the following:

- Residual radionuclide activities in surface and subsurface soil were less than RFCA Tier II soil ALs (DOE et al. 1996) and only slightly greater than background means plus two standard deviations (DOE 2003b).
- Further action was not indicated by the SSRS (DOE 2003b).

DOE received approval of NFAA status for PAC 600-1001 from CDPHE (the LRA) on June 24, 2003 (CDPHE 2003).

Comments

On June 23, 1997, while conducting a walk-down inspection of PAC 600-1001, two stained soil areas were identified immediately west of Building 663. The 1997 annual update to the HRR initially reported this occurrence as an addition to the original PAC 600-1001. Clarification was necessary based upon review, and it was decided in a meeting with the Agencies on May 18, 2000, to track the June 23, 1997 occurrence as PAC 600-1001(a). Refer to PAC 600-1001(a) for a description of the status of this occurrence.

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFPO, from S. Gunderson, CDPHE; RE: Final Closeout Report for IHSS Group 600-1 (PAC 600-1001), June 24.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001a, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE 2001b, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002a, Environmental Restoration RFCA Standard Operating Protocol (ER RSOP) Notification #02-04, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Closeout Report for IHSS Group 600-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Final Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-1001(a)

IHSS Number: Not Applicable
Current Operable Unit: Not Applicable
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Waste Oil in PAC 1001

This Final Update to the HRR for PAC 600-1001(a) consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 600-1001(a) is summarized in this update. The following HRR volumes contain PAC 600-1001(a) information:

Original Report – 1997 Annual (DOE 1997);
Original Report – 1999 Annual (DOE 1999);
Update Report – 2000 Annual (DOE (2000a);
Update Report – 2000 Interim (DOE 2000b); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

June 23, 1997

Historical Summary

On June 23, 1997, while conducting a surveillance walk-down of the Building 663 Lay-down Yard (PAC 600-1001), two oil-stained soil areas were identified immediately west of the building. The first stained area was approximately 10 ft west of the southwestern corner of the building where a 5-gallon bucket containing an oil-water mixture had overflowed due to recent rain. Stained soil around the bucket indicated that overflowing of the bucket had been ongoing for a prolonged period of time. During the assessment of the first finding, a second oil stain was identified approximately 100 ft north of the first where an abandoned piece of equipment was observed leaking what appeared to be hydraulic fluid onto the ground (soil). The location of PAC 600-1001(a) is shown on Figure 20.

Hazardous constituents may have been present because of past storage activities (refer to PAC 600-1001) and documented releases of radionuclides, oil, perclene, coolant, and acids.

PAC Investigations

In response to the June 23, 1997 occurrence, the HAZMAT Team and Shift Superintendent responded to the site. Radiological surveys were conducted at both sites, followed by soil sampling and sampling of the unknown oil in the 5-gallon bucket. The bucket and contents were placed into an overpack container, and both oil-stained areas were immediately cleaned up in accordance with Plant procedures (RMRS 1997). Gravel and soil from the two sites were containerized in accordance with Plant procedure and transported to a RCRA permitted storage facility (RFETS Fire Dept. Response Tracking 97-318). Samples were collected from the liquid in the bucket and both soil areas.

The following analyses were performed on the samples: fingerprint analysis (oil), radiological screens, isotopic analysis (plutonium, uranium, americium), TCLP metals, VOCs, and PCBs. Several VOCs were detected in the liquid sample, including 1,1,1-trichloroethane at 230 ppm, 1,2,4-trimethylbenzene at 100 ppm, and total xylenes at 260 ppm. Organics were not detected in either soil sample, and metals and radionuclides were not detected at levels greater than background (DOE 2000b).

No Further Action Recommendation

Sampling and analysis adequately characterized the compounds associated with the oil in the 5-gallon bucket and stained soil in both areas. The area was immediately cleaned up in accordance with Plant procedures, and the soil was containerized prior to transporting to a RCRA-permitted storage facility. In addition, the 5-gallon bucket and contents were overpacked prior to removal. There were no other contaminants associated with the release, and the spill was verified to be cleaned up.

PAC 600-1001(a) was addressed through the consultative process in NFA Working Group meetings on October 24, 2001, and November 14, 2001. Based on these discussions and the above facts, agreement was reached that an NFA was justified for PAC 600-1001(a). An NFA was verbally agreed to in the November 14, 2001 meeting and was formally approved in a letter from both CDPHE and EPA dated February 14, 2002 (CDPHE and EPA 2002).

Comments

The 1997 Annual Update to the HRR initially reported this occurrence as an addition to the original PAC 600-1001. Clarification was necessary based upon review, and it was decided in a meeting with the regulatory agencies on May 18, 2000, to track the June 23, 1997 occurrence as PAC 600-1001(a).

The February 14, 2002, NFA approval letter (CDPHE and EPA 2002) clarified, given that PAC 600-1001(a) was originally identified as part of PAC 600-1001, only PAC 600-1001(a) was agreed to as NFA. PAC 600-1001 would require further investigation (refer to PAC 600-1001).

References

CDPHE and EPA, 2002, Correspondence to J. Legare from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000b, Interim Update to the Historic Release Report - Response to Comments for HRR Annual Updates (1997, 1998, 1999), Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

RMRS, 1997, Environmental Operations CERCLA History Files, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 600-1002

IHSS Number: Not Applicable
Current Operable Unit: Not Applicable
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformer Storage - West of Building 666

This Final Update to the HRR for PAC 600-1002 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 600-1002 is summarized in this update. The following HRR volumes contain PAC 600-1002 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to 1992

Historical Summary

Unused and unusable transformers were stored and dismantled for spare parts on a concrete pad west of Building 666. It is suspected that the transformers were also stored inside of Building 666 within secondary containment basins. Leaks and spills of transformer oil may have occurred at this site according to Plant employees. The location for PAC 600-1002 is shown on Figure 20.

PCBs are the PCOCs at this location; however, radionuclides (plutonium-239/240) were also present in soil samples collected in July 1991. Plutonium-239/240 of unknown origin was detected at levels up to 9.1 pCi/g (DOE 1996).

Transformer storage had ceased by 1992; however, the building was also used as a primary TSCA waste storage facility (DOE 1992).

PAC Investigations

As part of a site-wide study of potential environmental releases of PCBs conducted in July 1991 (DOE 1991), eight soil samples were collected and analyzed for PCBs and radionuclides. The results indicated the highest PCB contamination level in the soil adjacent to the concrete transformer pad was 1.6 ppm (DOE 1996). Radionuclides were detected at activities greater than background. Plutonium-239/240 ranged from 0.4 to 9.1 pCi/g and did not require remediation.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have

dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site data and White Paper findings noted above, NFAA status was recommended for PAC 600-1002 in No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PACs) Sites (as proposed in 1996 HRR) (DOE 2004c).

After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the lead agency) on the NFAA status for PAC 600-1002 on May 6, 2004 (CDPHE 2004).

Comments

The boundaries of the original PAC location were estimated. PAC 600-1002 boundaries were revised based on sampling location surveys and field reconnaissance and documented in the 2004 Annual Update to the HRR (DOE 2004a).

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

DOE, 1991, Assessment of Potential Environmental Releases of Polychlorinated Biphenyls (PCBs) Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, July.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PACs) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-1003

IHSS Number: Not Applicable
Current Operable Unit: Not Applicable
Former Operable Unit: Not Applicable
IHSS Group: Not Applicable
Unit Name: Transformers North and South of 661/675 Substation

This Final Update to the HRR for PAC 600-1003 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 600-1003 is summarized in this update. The following HRR volumes contain PAC 600-1003 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to 1997

Historical Summary

PAC 600-1003 consists of two transformer sites. Evidence of a leaking valve was discovered on the northern side of Transformer 661-1 (PCB Site 12), which was located on the northern side of the 661/675 Substation (DOE 1991). The transformer was situated on a concrete pad and there was no berm around the transformer pad. Another transformer was located south of the 661/675 Substation, identified as Transformer 675-1 (PCB Site 13). There was no evidence that the transformer was leaking or had leaked in the past, and it was retrofitted in 1987. The location of PAC 600-1003 is shown on Figure 20.

PAC Investigations

Based on 1985 analytical results, PCB levels in the 661-1 and 675-1 transformer dielectric oil were 12 and 5 ppm, respectively (DOE 1992).

As part of a site-wide study of potential environmental releases of PCBs conducted in July 1991 (DOE 1991), soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. PCB results obtained in 1992 for the 661-1 and 675-1 transformer dielectric oil were 11 and 5 ppm, respectively (DOE 1996). Results from four soil samples collected in 1991 at 661-1 (PCB Site 12), indicated PCB concentrations ranged from 5.4 to 61 ppm. Radionuclide results from analyses at the same locations indicated activities greater than background. Plutonium-239/240 ranged from 0.5 to 22.5 pCi/g. Results from four soil samples collected in 1991 at 675-1 (PCB Site 13), indicated PCB concentrations ranged from 1.0 to 4.1 ppm. Radionuclide results from analyses collected at the same locations indicated activities greater than background. Plutonium-239/240 ranged from 1.04 to 2.71 pCi/g.

Under the approved Final PAM for Remediation of PCBs (DOE 1995), 46.3 cy of PCB-contaminated soil were excavated from PAC 600-1003, containerized, and disposed of (DOE

1997). No concrete was removed because PCB levels on the concrete transformer pads were measured at less than 0.086 ppm using EPA Method 8080.

Verification soil samples and concrete samples were collected and screened (DOE 1997). Twenty-one soil samples were collected around 661-1. All were analyzed using immunoassay Method 4020 and five were analyzed using EPA Method 8080. Method 8080 results indicated PCB concentrations did not exceed 0.46 ppm. Nine soil samples were collected around 675-1. All were analyzed using immunoassay Method 4020 and three were analyzed using EPA Method 8080. Method 8080 results indicated PCB concentrations did not exceed 0.27 ppm. Additionally, 24 soil samples were collected east of the 661-1/675-1 substation. All were analyzed using immunoassay Method 4020 and six were analyzed using EPA Method 8080. Method 8080 results indicated PCB concentrations did not exceed 0.67 ppm. The 661/675 substation was demolished in 1997.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site remediation and confirmation data, and the White Paper findings noted above, NFAA was recommended for PAC 600-1003 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PACs) Sites (as proposed in 1996 HRR) (DOE 2004c).

After review of site data, including the closeout report for the source removal of PCBs (DOE 1997), and the White Paper by the regulatory agencies, DOE received approval from CDPHE (the lead agency) on the NFAA status for PAC 600-1003 on May 6, 2004 (CDPHE 2004).

Comments

The boundaries of the original PAC location were estimated. PAC 600-1003 boundaries were revised based on sampling location surveys and field reconnaissance and documented in the 2004 Annual Update to the HRR.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: No Further Accelerated Action Justification PCB Potential Areas of Concern April 16, 2004, May, 6.

DOE, 1991, Assessment of Potential Environmental Releases of Polychlorinated Biphenyls (PCBs) Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, July.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1996, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Closeout Report for the Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PACs) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 600-1004

IHSS Number(s): Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 600-5
Unit Name: Central Avenue Ditch Soil Spreading

This Final Update to the HRR for PAC 600-1004 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 600-1004 is summarized in this update. The following HRR volumes contain PAC 600-1004 information:

Update Report – Sixth Quarterly (DOE 1994a);
Update Report – Seventh Quarterly (DOE 1994b); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

September 27, 1993

Historical Summary

On September 27, 1993, during a walk-down tour, CDPHE representatives observed the spreading of excavated soils from the Central Avenue Ditch (PACs 400-157.1, 000-172, and 000-190 [Figures 14 and 18]) into areas adjacent to the two large fuel-oil tanks located on the southwestern corner of Central Avenue and Seventh Street (IHSS 600-152) (DOE 1994a). The location of PAC 600-1004 is shown on Figure 20.

A review of the operations revealed that the ditch soils were spread into IHSS 600-152 without proper authorization and in conflict with the April 7, 1993, Environmental Assessment for Construction Activities (Soils Disturbance Permit #TG048663) which provided specific instructions that all dirt, soil, gravel, and rock removed from any of the ditches to be cleaned were to remain on the bank of the ditch and in the immediate area from which they were originally removed. All material removed was to be spread and incorporated into the banks of the ditch. Although no soil and/or water samples were required for this work, radiological screening was required when working in any of the IHSSs involved in this activity (DOE 1994a).

The operation was immediately shut down due to the potential of cross-contamination from one or more IHSSs to IHSS 600-152. Several actions were taken to prevent a similar occurrence in the future. In general, these included briefings/training of personnel to increase awareness of proper procedures by employees working in IHSS areas (DOE 1994a).

PAC Investigations

HPGe surveys of the Central Avenue Ditch were conducted both before and after the disturbance. No radiological contamination was observed above background levels in either case (DOE 1994a).

Nine surface and subsurface soil RFCA (DOE et al. 1996) accelerated action characterization samples were collected at PAC 600-1004 in accordance with the IASAP (DOE 2001) and IASAP Addendum #IA-04-09 (DOE 2004b). Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all concentrations and activities were less than RFCA WRW soil ALs (DOE et al. 2003). Plutonium-239/240 exceeded background levels in only one sample at an activity of 0.578 pCi/g, uranium-234, uranium-235, and uranium-238 were detected at maximum activities of 4.8, 0.203, and 3.736 pCi/g, respectively. PAHs were detected in a majority of samples. These compounds are associated with runoff from asphalt paved areas entering the ditch. Analytical results for the characterization are presented in the Data Summary Report for IHSS Group 600-5 (DOE 2004c).

No Further Action Recommendation

Based on analytical results and the SSRS, an NFAA determination was justified for PAC 600-1004 in the 2004 Annual Update to the HRR (DOE 2004a) for the following reasons:

- Concentrations of COCs were less than RFCA WRW soil ALs.
- Migration of contamination to surface water through erosion is unlikely because this IHSS Group is not in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in PAC 600-1004.

After review of the Data Summary Report (DOE 2004c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 600-1004 on June 18, 2004 (CDPHE 2004).

Comments

This PAC was formerly identified as PAC 400-820 in the Sixth Quarterly Update to the HRR (DOE 1994a). It was re-designated as PAC 600-1004 in the Seventh Quarterly Update (DOE 1994b) to more accurately reflect its mapped location.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE; RE: Approval, Draft Data Summary Report for IHSS Group 600-5, PAC 600-1004 (June 2004), June 18.

DOE, 1994a, Sixth Quarterly Update for Historical Release Report, October 1, 1993 to January 1, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1994b, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Industrial Area Sampling and Analysis Plan Addendum #IA-04-09, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004c, Data Summary Report for IHSS Group 600-5, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 600-1005

IHSS Number: Not Applicable
Current Operable Unit: IA
Former Operable Unit: Not Applicable
IHSS Group: 600-6
Unit Name: Former Pesticide Storage Area

This Final Update to the HRR for PAC 600-1005 consolidates the information in the initial 1992 HRR and subsequent HRR updates. The disposition of PAC 600-1005 is summarized in this update. The following HRR volumes contain PAC 600-1005 information:

- Annual Report – 1992 (DOE 1992);
- Update Report – Seventh Quarterly (DOE 1994);
- Update Report – 2002 Annual (DOE 2002); and
- Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

Mid-1970s to approximately 1982

Historical Summary

PAC 600-1005 represents the former site of a shed (Building 667) that was used to store pesticides. This site was located several hundred feet north of Building 850 in the Building 881 parking lot. The location for PAC 600-1005 is shown on Figure 20. It is believed that sometime in 1982, the original pesticide shed was relocated to an area southwest of Building 371. At this new location, the building was renamed Building 367 (now designated PAC 300-702) and continued to house pesticides until 1988.

It is assumed that pesticides and herbicides were stored at the Building 667 location through at least 1978. It is possible that pesticides and/or herbicides were spilled during loading or mixing operations (DOE 1992). In addition, it is possible that the floor of the shed at this location consisted of bare soil for a period of time, increasing the potential for residual amounts of pesticides remaining at the site. Although possible, no known rinsing of pesticide containers occurred at the shed. There has never been a documented release from activities performed at this location.

A list of pesticides known to have been stored in Building 667 as of 1978 is provided in the 2003 Annual Update to the HRR (DOE 2003a).

PAC Investigations

In accordance with RFCA (DOE et al. 1996) IASAP Addendum #IA-02-01 for IHSS Group 600-6 (DOE 2001), two surface soil characterization samples were collected at PAC 600-1005 on April 8, 2002. Analytical results for herbicides and pesticides from two locations were all below the reporting limit (and therefore all were less than the RFCA WRW soil ALs [DOE et al. 2003]). Analytical results for characterization samples for PAC 600-1005 are presented in the Data Summary Report for IHSS Group 600-6 (DOE 2003b).

No Further Action Recommendation

Based upon characterization sample results collected for PAC 600-1005 (DOE 2003b), no potential contaminant source could be identified for PAC 600-1005. All sample results were below the RLs for PCOCs. PAC 600-1005 was proposed for NFAA status in the Data Summary Report (DOE 2003b) for the following reasons:

- All contaminant concentrations are less than RFCA WRW soil ALs.
- There is no identified potential to exceed surface water standards at a POC from this IHSS Group.

DOE received approval of NFAA status for PAC 600-1005 from CDPHE (the LRA) on May 15, 2003 (CDPHE 2003).

Comments

The storage shed was relocated from the Building 881 parking lot to make room for additional parking spaces. However, the location of PAC 600-1005 did not change.

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE; RE: Final Data Summary Report for IHSS Group 600-6, May 15.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994, Seventh Quarterly Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report, IHSS Group 600-6, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, Rocky Flats Environmental Technology Site, Golden, Colorado, June.